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# **Annotated Bibliography of Federal Fruit and Nut Research in the Southeast, 1914-81**

**ABSTRACT**

Snow, J. Wendell. 1984. Annotated Bibliography of Federal Fruit and Nut Research in the Southeast, 1914-81. U.S. Department of Agriculture, Agricultural Research Service, ARS-13 , 100 pp.

This bibliography is an annotated listing of all papers (718 grower and scientific publications) published by researchers at the U.S. Department of Agriculture's fruit and nut laboratories in Monticello, Fla., and Albany, Byron, Fort Valley, and Thomasville, Ga., from 1914 through 1981. The papers listed deal mostly with the culture, pests, and diseases of peaches and pecans, but other Southeastern fruits and nuts are included.

**KEYWORDS:** apples, bibliographies, chestnuts, fruit, insect pests, nuts, peaches, pecans, plant diseases.

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By J. Wendell Snow

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## INTRODUCTION

The U.S. Department of Agriculture (USDA), Agricultural Research Service, Southeastern Fruit and Tree Nut Research Laboratory was established and dedicated on May 13, 1970 when both personnel and research activities were moved from the pecan research station, Albany, Ga., and the fruit research station, Fort Valley, Ga., to Byron, Ga. The consolidation was done because of the superior facilities available in Byron and its location in a high production area of both fruit and nuts. Since its establishment, the research station has grown and has been an important factor in supplying the technology necessary for the production of fruit and nuts in the Southeast. In its total history, 712 grower and scientific publications have been published on all aspects of fruit and nut production and practices (Byron and parent locations combined).

The many changes in locations and personnel during the evolution of Byron is the reason an annotated listing of the papers with a subject and author index has been prepared. Many of the papers are unavailable in libraries but represent all or most of the important earlier research on peach phony disease, alternate bearing, variety development, bunch disease and other important areas of research. Except where noted, all publications are in the collection of the National Agricultural Library in Beltsville, Md.

During the early 20th century, Federal research on peaches in the Southeast was done mostly by researchers working out of Washington, D.C., or State College, Miss. on short-term details to Georgia, South Carolina, and Alabama. The research was conducted on an as need basis and was usually pathological or entomological in nature. In 1920, a serious outbreak of the plum curculio occurred at Fort Valley, Ga., then the peach growing center of the United States, and millions of dollars and most of the 1920 crop were lost. The outbreak was largely caused by

careless and inadequate attempts at control, but the result was the establishment by the U.S. Department of Agriculture of a peach research station in Fort Valley with one entomologist, Oliver I. Snapp. His first assignment was to determine the life cycle of the plum curculio and develop control procedures. In 1922, peach phony disease became a serious problem in the Southeast with the heaviest losses in the Fort Valley area. As a result a second laboratory was established in Fort Valley with L. C. Cochran as the pathologist and W. F. Turner as the entomologist. Later, other researchers were added to this staff and in 1930 the station was changed to a horticultural field station. J. H. Weinberger served as the superintendent until 1950 when V. E. Prince succeeded him until the station closed in 1970. In 1960 the original entomology research activities in Fort Valley were moved to the horticultural field station where it remained until relocating to Byron.

The pecan industry began in the Southeast before 1900, when trees were introduced from the Mississippi River basin. The first were planted from seeds and produced nuts with a tremendous range in size and quality. Around 1910, large acreages of named varieties were planted, particularly near Albany and Thomasville, Ga., and Monticello, Fla., as part of a speculation scheme. Investors were sold small orchards with promises of big profits with as few as 5 acres. The outcome was always disappointment, and eventually the plantings were consolidated into larger fields, but the scheme did help establish the pecan industry in the Southeast. The tree had few problems until about 1920 when most of the disease and insect pests of hickory had become adapted to the new crop.

This situation led to the establishment by USDA of research stations almost simultaneously at Thomasville, Ga., and Monticello, Fla., in mid-1930. Both

locations had limited staffs usually including an entomologist, a pathologist, and a soil scientist. Some researchers served at both locations during their career, but the Monticello laboratory was never directly a part of the evolution of Byron. However, because of the overlap and cooperative activity, research conducted there has been included in the bibliography. Around 1950, the laboratory at Monticello was turned over to the State of Florida and the Thomasville laboratory was closed and its research activities moved to Albany, Ga. This was because the high level of pecan production around Albany had made it the principal production area of the United States. The research activity remained in Albany until its closing in 1970. All published manuscripts from Monticello, Thomasville, Fort Valley, and Byron from the beginning through 1981 are included in this bibliography.



# BIBLIOGRAPHY

## A

1. Alben, A. O.; Cole, J. R.; and Lewis, R. D. 1932. New developments in treating pecan rosette with chemicals. *Phytopathology* 22:979-981. Research is reported in which pecan foliage showing pronounced rosette symptoms was sprayed with zinc sulphate or zinc-lime sprays and prompt favorable response of the trees is reported from the treatments. The dipping of terminal parts of branches in zinc solutions produced the same results. These data indicate that zinc is an essential element for the healthy development of the pecan tree.
2. Alben, A. O.; Cole, J. R.; and Lewis, R. D. 1932. Chemical treatments of pecan rosette. *Phytopathology* 22:595-601. Pecan rosette is apparently a nonparasitic disease of widespread distribution occurring on both residual and alluvial soils. A varietal resistance or susceptibility to rosette seems to exist. 'Stuart' is the most susceptible, while 'Moneymaker' seems to be highly resistant. The writers were able to improve old rosetted leaves and bring the young ones back to normal by dipping or spraying them with a solution of ferric sulphate or ferric chloride, ranging in strength from 0.6 to 1 percent. These findings would seem to indicate that pecan rosette is a condition of iron chlorosis.

## B

3. Backman, P. A.; Wehunt, E. J.; Horton, B. D.; and Dowler, W. M. 1972. Effect of soil fumigation on root density of peach trees on a short-life site. (Abstr.) *Phytopathology* 62:745. Data are presented that show a direct relationship between DBCP and root density, which may be a factor in tree longevity.

4. Baker, Howard, and Cole, J. R. 1932. Prepollination spraying of pecans for the control of insects and diseases. *Proc. Annu. Conv. Natl. Pecan Assoc. Bull.*, 31st, pp. 55-58. In tests with lead arsenate and bordeaux mixture, it was found that no injury occurred to pistillate flowers or tender foliage when lead arsenate was used alone, but severe burning resulted when it was used in combination with bordeaux mixture. Mild burning also resulted from the bordeaux mixture alone.
5. Barnes, G. L.; Boethel, D. J.; Eikenbary, R. D.; Criswell, J. T.; and Gentry, C. R. 1975. Growth and sporulation of Metarrhizium anisopliae and Beauveria bassiana on media containing various peptone sources. *J. Invertebr. Pathol.* 25:301-305. Two entomogenous fungi, Metarrhizium anisopliae and Beauveria bassiana, were cultured in liquid culture media containing various commercial peptone sources to determine the effect of the source on growth and sporulation. Tryptone, Casitone, and yeast extract were effective for mycelial growth of M. anisopliae; however, yeast extract was the most effective in production of spores. Soytone, Casitone, Neopeptone, and casein hydrolysate were used effectively for mycelial growth of B. bassiana, but the latter two were not as effective for production of spores.
6. Barry, R. M., and Payne, J. A. 1974. "Minor" insects of pecans. *Proc. Southeast. Pecan Grow. Assoc.* 67:110-115. A series of minor insects that sometimes attack pecan are listed and discussed. Among these are the Japanese beetle, ambrosia beetle, sawfly, bagworms, Heliothis spp., archips leaf roller, and geometrids.
7. Bennett, A. H., and Wells, J. M. 1976. Peach precooling aims at perfection. *Am. Fruit Grow.* 96:13,

33. These data are also presented by the authors in a scientific paper (No. 8).
8. Bennett, A. H., and Wells, J. M. 1976. Hydraircooling: a new precooling method with special application for waxed peaches. J. Am. Soc. Hortic. Sci. 101:428-431. Hydraircooling is shown as a superior method to cool peaches. In a paired test with hydrocooling, it was equally effective in controlling diseases and required only about one-half the time.
9. Bennett, A. H.; Wells, J. M.; and Wilson, R. L., Jr. 1979. The effect of precooling, waxing and storage humidity on the postharvest quality and weight loss of peaches. Proc. Int. Conf. Refrig., 15th, C2-70:1-7. This paper is unavailable from the library.
10. Beno, M. A.; Cox, R. H.; Wells, J. M.; Cole, R. J.; Kirksey, J. W.; and Christopher, B. G. 1976. Structure of a new [11] cytochalasin, cytochalasin H or Kodo-cytochalasin-1. J. Am. Chem. Soc. 99:4123-4130. The crystal structure determination of a new cytochalasin toxin has proven the constitution of this compound and provided new information on the conformation of the multiple ring structure in this class of fungal metabolites.
11. Beroza, M.; Gentry, C. R.; Blythe, J. L.; and Muschik, G. M. 1973. Isomer content and other factors influencing captures of oriental fruit moth by synthetic pheromone traps. J. Econ. Entomol. 66:1307-1311. Zoecon Pherotrap-1 traps placed 3 ft from the ground were shown as the most effective trap design and placement for capture of oriental fruit moth males. A concentration of 0.8  $\mu$ l pheromone + 8  $\mu$ l synergist was the most effective tested combination of pheromone-synergist. Addition of (Z)-8-dodecenyl alcohol to the mixture reduced capture. The addition of a small percentage of E isomer of the pheromone to the mixture enhanced attraction.
12. Beroza, M.; Muschik, G. M.; and Gentry, C. R. 1973. Small proportion of opposite geometric isomer increases potency of synthetic pheromone of oriental fruit moth. Nature New Biol. 244:149-150. The addition of 8% E isomer of (E)-8-dodecen-1-ol-acetate to the Z isomer increased the capture of male oriental fruit moths in sticky traps by over 25 times.
13. Bissell, T. L. 1928. An interesting aphid of the pecan. J. Econ. Entomol. 41:551-553. An aphid, Myzocallis fumipennellus F., injures pecan foliage in several sections of the pecan belt, including southern Georgia. The species is marked by its dark color, prominent tubercles and the effect of its feeding on the leaves. Around the puncture of a nymph appears a yellow spot that turns brown. Spots are identified by a rectangular effect and a dark margin. Heavy infestation may cause defoliation.
14. Bissell, T. L. 1929. What the pecan weevil is doing. Natl. Pecan Exch. News 6:7-10. This is a popular article that discusses the life cycle, biology, damage, economic importance, and variety resistance to the pecan weevil.
15. Bissell, T. L. 1931. Experiments on controlling larvae of the pecan weevil by cultural methods. J. Econ. Entomol. 24:861-866. Experiments covering one season show that larvae of the pecan weevil can be prevented from burrowing into the soil under pecan trees by hand raking and rolling and to a lesser degree by raking alone when such operations are performed just previous to the time of emergence of the larvae from the nuts.
16. Boethel, D. J.; Eikenbary, R. D.; Bolte, J. R.; and Gentry, C. R. 1974. Sampling pecan weevil nut infestations: effects of tree, height, and sector. Environ. Entomol. 3:208-210. This study shows that the infestation of nuts by the pecan weevil is not related to tree height or directional sector. The authors point out that the data mean that



samples may be taken from individual trees at any height or direction without bias..

C

17. Calcote, V. R. 1970. Conotrachelus hicoriae controlled by applications of insecticides to soil. J. Econ. Entomol. 63:2010-2011. In 1968, dieldrin gave excellent control of the nut curculio but, disulfoton and aldicarb were ineffective. In 1969, dieldrin and carbofuran were effective; however, phoxim and Mocap were not effective.
18. Calcote, V. R. 1974. Soil treatment tried. Pecan Q. 8:14-15. Eight insecticides applied to the soil were tested during 1968-70 as a control for the nut curculio. Dieldrin, carbofuran, and N-2596 were the most effective insecticides. Some control was obtained with all tested materials.
19. Calcote, V. R. 1974. Chemicals check mites. Pecan Q. 8:27. Six insecticides were applied as foliar sprays to control the leaf scorch mites. Monocrotophos and dimethoate gave the best control, while GS-13005, Dowco 213, parathion + sulfur were somewhat less effective. Chlordimeform did not provide any control.
20. Calcote, V. R. 1974. Combination of two insecticides and sticker tested against the pecan weevil on pecan. J. Econ. Entomol. 67:695-696. Various combinations of carbaryl and phosalone were tested separately and together as a control for the pecan weevil. Treatments with carbaryl gave excellent control while phosalone alone gave significantly poorer control. The addition of a sticker did not affect control.
21. Calcote, V. R. 1975. Feeding and initial oviposition as related to nut development. J. Econ. Entomol. 68:4-6. Male weevils penetrated the nut shells through Aug. 14 and caused immature nuts to fall. Thereafter, as the shells hardened, males penetrated through the shucks only. The majority of nuts punctured before Aug. 18 fell in 6-15 days; nuts punctured after Aug. 18 remained green and adhered to the tree past normal harvest. Individual male and female pecan weevils destroyed an average 0.23 and 0.29 nuts/day, respectively. Females began oviposition on Aug. 18, the date when thin cotyledonous layers were formed inside the seedcoat.
22. Calcote, V. R. 1975. Insecticide combinations, sticker tested against pecan weevil. Pecan South 2:98-106. Carbaryl has been found to be an effective insecticide for control of adult pecan weevil but is less effective against other pecan insects. Phosalone, effective against hickory shuckworm and pecan aphids, was tested with carbaryl to determine which combinations gave best weevil control. Also, an extender sticker was included to determine if it would enhance the effectiveness of the insecticides. Carbaryl applied alone at 1.0 lb/acre or when used at 0.5 lb with phosalone at 0.25 lb gave good control. Phosalone applied alone was not very effective, and the sticker did not increase the effectiveness of either insecticide.
23. Calcote, V. R. 1976. Foliar insecticides for control of spittlebug on pecan. Pecan South 3:300-301. Supracide, Zolone, and Guthion are reported as giving excellent control of the spittlebug. Thiodan was less effective.
24. Calcote, V. R., and Bagent, J. L. 1974. Phylloxera control sought. Pecan South 1:8-9. Tests were conducted in 1972 and 1973 to control the pecan phylloxera. All treatments reduced populations significantly but endosulfan and BHC were the superior treatments.
25. Calcote, V. R., and Gentry, C. R. 1973. Mating behavior of fall webworms and attraction of male moths to traps baited with virgin females. J. Econ. Entomol. 66:1006-1007. This is an excellent paper that shows female fall webworms call for only a very short period around dawn. Males are reported as first active about 30 minutes before dawn with peak activity about 10 minutes before light. All male activity

- subsided about 7 minutes before sunrise, but copulating pairs remained in copula up to 2 hours.
26. Calcote, V. R.; Gentry, C. R.; and Edwards, G. W. 1972. Comparison of two types of light traps in capturing moths of the pecan nut casebearer. *J. Econ. Entomol.* 65:933-934. Light traps with baffles caught significantly more pecan nut casebearer moths and nontarget insects than did light traps without baffles. Placing the bulbs in a horizontal position on the traps without baffles did not increase the capture to a level comparable to the standard light traps.
  27. Calcote, V. R.; Gentry, C. R.; and Edwards, G. W. 1972. Nightly activity and mating behavior of pecan nut casebearers captured in traps. *J. Econ. Entomol.* 65:909-911. Tests were conducted that show peak female activity from 3 to 6 h after sunset while the majority of males were captured 6 to 9 h after sunset. However, moths of both sexes were captured throughout the night. Dissected females usually had one spermatophore, but up to 6 per female were recovered.
  28. Calcote, V. R., and Smith, J. S., Jr. 1974. Attraction of five pecan insect species to light traps equipped with various colored lamps. *J. Econ. Entomol.* 67:461-463. In a comparison of the attractiveness of nine different lamps to pecan pests, the blacklight lamp was generally superior in attracting the five species. However, a green lamp could be useful in surveys of hickory shuckworms because it was moderately attractive to hickory shuckworm and attracted substantially fewer nontarget insects than the blacklight lamp.
  29. Calcote, V. R., and Tedders, W. L., Jr. 1964. Experiments for control of the pecan leaf casebearer. *Proc. Southeast. Pecan Grow. Assoc.* 57:61-63. Tests were conducted using insecticides and fungicides or both as controls for the pecan leaf casebearer, and data indicated that insecticides plus fungicides, or fungicides only, were effective as controls.
  30. Calcote, V. R.; Tedders, W. L., Jr.; and Osburn, M. R. 1965. Control of pecan leaf casebearer and hickory shuckworm on pecan. *Proc. Southeast. Pecan Grow. Assoc.* 58:45-47. One of five applications of Triphenyltin hydroxide and five applications of zineb were very effective in controlling leaf casebearer and compared very well with the standard malathion treatment of one application. One of five applications of dodine and one application of zineb did not perform in a satisfactory manner. The standard recommended EPN treatment was the most effective insecticide and provided satisfactory control of hickory shuckworm. Bayer Bay44646 and Upjohn U-17004 were slightly better than no treatment, but endosulfan provided no control. The results also showed that three applications of any one of the four materials were very effective against the leaf casebearer as compared with the untreated control.
  31. Campbell, R. K.; Perring, T. M.; Barnes, G. L.; Eikenbary, R. D.; and Gentry, C. R. 1978. Growth and sporulation of Beauveria bassiana and Metarrhizium anisopliae on media containing various amino acids. *J. Invertebr. Pathol.* 31:289-295. Data are presented on two isolates of entomogenous fungi, Beauveria bassiana and Metarrhizium anisopliae, cultured in liquid culture media containing 24 amino acids and  $\text{KNO}_3$ . The effects of the various amino acids on growth and sporulation are reported.
  32. Cochran, L. C.; Weinberger, J. H.; and Turner, W. F. 1951. Natural occurrence of the phony virus in wild chickasaw plums near peach orchards in Georgia. *Plant Dis. Rep.* 35:181-182. The principal role of the chickasaw plum is as a holdover reservoir from which new peach orchards become infected when planted adjacent to the infected plums. The evidence has now reached a point where any recommendation for control of the phony virus should



- include elimination of wild plums adjacent to and near peach orchards.
33. Cole, John R. 1933. Vein spot of the pecan caused by Leptothyrium nervi-sedum, N. sp. J. Agric. Res. 46:1079-1088. Vein spot, a foliage disease of the pecan, is described and was collected by the writer in Louisiana, Arkansas, Mississippi, and Texas. The fungus attacks the vascular system of the leaf. Heavy infection results in severe injury to the foliage or in premature defoliation. A varietal susceptibility to the fungus appears to exist especially in Louisiana. The 'Van Deman' is the most susceptible variety, and the 'Frotscher' is the next most susceptible. Very good control of the disease was observed in plots sprayed with bordeaux mixture, monohydrated copper sulphate and lime dust.
  34. Cole, John R. 1933. Liver-spot disease of pecan foliage caused by Gnomonia caryae pecanae, nov. var. J. Agric. Res. 47:869-881. Liver spot, a foliage disease of pecans, has been collected in Mississippi, Arkansas, Louisiana, and Texas. The disease first appears on the lower surface of the leaves as circular brown spots resembling liver in color. The name "western sooty spot" now in use indicates that the leaf spot is black, which is not the case; the writer believes that "liver spot" would be a better term for this disease. The fungus causes the greatest injury to trees of low vitality, but it also attacks vigorous trees and occasionally causes premature defoliation. It seems to thrive best in climates of high temperature and low rainfall. The varieties 'Schley' and 'Georgia Giant' were noted as highly resistant, whereas the 'Stuart', 'Van Deman', and 'Pabst' varieties were very susceptible. One application of 4: 6: 50 bordeaux mixture gave almost perfect control of the liver-spot fungus.
  35. Cole, John R. 1935. Gnomonia nervi-seda, the perfect stage of the fungus that causes the vein spot disease of pecan foliage. J. Agric. Res. 50:91-96. Vein spot, a foliage disease of pecans, caused by Gnomonia nerviseda, comb. nov., has been collected by the writer in Arkansas, Louisiana, Mississippi, and Texas. The disease attacks the rachis, the petiole, or the veins, and is always confined to the vascular system of the leaf, thereby suggesting the name "vein spot". Heavy infection results in severe injury to the foliage or in premature defoliation. The pycnidial stage of the vein spot fungus, Leptothyrium nervisedum Cole, does not appear until summer or early fall, while the perfect stage appears the following spring on the fallen leaves along the old vein spot lesions. The writer was able to demonstrate the relationship between the pycnidial and the perfect stage of the vein spot fungus. The perfect stage of the vein spot fungus is described as new, Gnomonia nerviseda.
  36. Cole, John R. 1937. Bunch disease of pecans. Phytopathology 27:604-612. A disease of pecan trees named "bunch" on account of its characteristic symptoms, was first determined in the spring of 1932 on trees growing in the Red River Valley near Shreveport, La. Previous to this time the bunch disease had been confused with pecan rosette, a nutritional disease, and was not identified as a distinct disease until the control of rosette by the use of zinc sulphate was perfected.
  37. Cole, John R. 1944. Low-lime bordeaux mixture controls leaf gall on azaleas. Phytopathology 34:354-355. Experiments in the control of leaf gall on azaleas were conducted on azaleas adjacent to pecan trees. A 6-2-100 bordeaux mixture was used and gave excellent control of the leaf gall for 9 years. There was no evidence of injury to either flowers or plants.
  38. Cole, John R. 1947. Spraying to control pecan scab on the Schley and Moore varieties, Albany, Georgia and Monticello, Florida. Proc. Southeast. Pecan Grow. Assoc. 40:10-17. This is a general article written in popular style that discusses the

- distribution, importance, and control of scab. A bordeaux mixture is cited as the best control.
39. Cole, John R. 1947. A comparison of home-made bordeaux mixture with other fungicides for control of scab on the Schley and Moore varieties of pecan. *Phytopathology* 38:106-109. For 12 years, tests were conducted against scab in an effort to find a replacement for bordeaux mixture. All materials tested were inferior to this material except for copper A and fermate.
  40. Cole, John R. 1948. Results of eleven years' spraying for pecan scab control with high-lime and low-lime bordeaux mixture. *Phytopathology* 38:552-555. Results of spraying tests for 11 years with 6-2-100 bordeaux mixture, a 6-2-100 bordeaux plus summer oil emulsion, and a 6-6-100 bordeaux to control pecan scab are presented. There was no significant difference in yield of nuts resulting from the various bordeaux mixtures used. The differences in yield between the sprayed and unsprayed trees were highly significant.
  41. Cole, John R. 1948. Zinc dimethyl-dithiocarbamate (Zerlate or Karbam White), a promising fungicide for pecan scab control. *Phytopathology* 38:921-922. Experiments were conducted with bordeaux mixture and Zerlate to control pecan scab with good control. There was a buildup of black pecan aphids on both the bordeaux mixture and Zerlate sprayed trees.
  42. Cole, John R. 1950. Control of pecan scab disease in 1950. *Proc. Annu. Meeting Okla. Peach Grow. Assoc.*, pp. 14-20. Results of spray tests are reported from Monticello, Fla. and Albany, Ga. Low-lime bordeaux mixture and ziram provided the best control.
  43. Cole, John R. 1952. Reasons why some growers fail to obtain control of pecan scab by spraying and suggested corrections. *Proceedings Texas Pecan Growers Association*, 31st, pp. 68-73. This paper is written for farmers and discusses the many problems that can be encountered in controlling scab. Such things as bad weather, poor timing of applications, inadequate spray equipment, poor labor, etc., are discussed.
  44. Cole, John R. 1953. Problems in growing pecans. *U.S. Dep. Agric. Yearb. Agric.* 1953, pp. 796-800. This is an excellent review article and all the major diseases and physiological disorders of pecans are covered in brief detail.
  45. Cole, John R. 1954. A disease of pecans resembling both rosette and bunch collected in New Mexico. *Plant Dis. Rep.* 38:443-444. Both rosette and bunch disease are reported from trees near Las Cruces, N.M. This is the first report of bunch disease occurring in New Mexico.
  46. Cole, John R. 1955. Variable response to fungicide sprays during the drought of 1954. *Proc. Southeast. Pecan Grow. Assoc.* 48:10-11. Losses from scab are reported from Georgia on pecans in 1954 despite the driest year on record. This was the first year the author saw spray injury caused by bordeaux mixture. Bordeaux mixture, Zerlate, and Dithane gave good control of pecan scab.
  47. Cole, John R. 1958. Weather conditions are an important factor in pecan scab control. *Proc. Southeast. Pecan Grow. Assoc.* 51:77-79. The recommendation is made that growers should apply two applications of 4-1-100 bordeaux mixture to control pecan scab and then inspect trees to determine if a pistillate bloom spray is also needed. If so, the bordeaux mixture, ziram, or zineb was recommended.
  48. Cole, John R. 1959. Initial results from antibiotic treatments of pecan nursery tree roots for control of crown gall (*Agrobacterium tumefaciens*). *Proc. Southeast. Pecan Grow. Assoc.* 52:76-79. A series of antibiotics were tested for control of crown gall on pecan nursery trees by soaking the roots for 1 h in a solution containing the antibiotic. Terramycin provided good control; all treated trees were healthy after one growing season.
  49. Cole, John R. 1959. Spanish-moss in pecan trees can be controlled by



- spraying dormant trees with copper and calcium arsenate. Plant Dis. Rep. 43:960-961. Dormant sprays of copper sulfate and calcium arsenate applied once a year eliminated Spanish moss from pecan trees in 3 years. The writer noted that a control program for other diseases using bordeaux mixture also controlled Spanish moss.
50. Cole, John R. 1960. Dodine, an outstanding fungicide for pecan scab control. Proc. Southeast. Pecan Grow. Assoc. 53:34-35. In tests conducted to control pecan scab, dodine gave better control than bordeaux mixture, zineb, or ziram. Four applications of dodine was better than six applications of the other three fungicides.
  51. Cole, John R. 1961. Cyprex and pecans. Cyanograms 8:2-7. Cyprex (dodine) is reported as an effective fungicide for the control of pecan scab when applied with ground equipment or with airplanes.
  52. Cole, John R. 1961. Grower tests airplane to control pecan scab in Georgia, 1960. Proc. Southeast. Pecan Grow. Assoc. 54:120-121. Two applications of dodine (Cyprex) applied by airplane are reported as giving satisfactory control of scab as measured by the harvest records.
  53. Cole, John R. 1962. Both dodine and zineb (Dithane) controlled scab in the Fort Valley, Georgia, area during a year of moderate rainfall. Proc. Southeast. Pecan Grow. Assoc. 55:97-102. Tests were conducted in 1961 with dodine and zineb as a control for pecan scab. Both materials produced more and better nuts than the unsprayed check. However, the most nuts of comparable quality were harvested from trees sprayed with dodine.
  54. Cole, John R. 1964. Results of three years of spraying with dodine to control pecan scab. Phytopathology 54:1283-1284. Dodine is shown as an effective control for pecan scab at 0.5, 1.0, 1.5, and 2.0 lb/100 gal of water. The 2 lb/100 gal treatment was significantly better than the 0.5- and 1.5-lb treatments but was not better than the 1-lb treatment.
  55. Cole, John R. 1965. Liver spot disease of pecan extends its range into Georgia. Plant Dis. Rep. 49:148. The liver spot disease is reported from Cordele, Ga., and only on the 'Pabst' variety.
  56. Cole, John R. 1965. 1964 spray tests to control pecan scab. Plant Dis. Rep. 49:703-707. Experiments were conducted at Albany and Cordele, Ga., with new and standard fungicides for controlling pecan scab. Of the newer fungicides, Triphenyltin hydroxide (Du-Ter) was superior to dodine in controlling pecan scab.
  57. Cole, John R. 1968. Four fungicides controlled pecan scab (Fusicladium effusum [Wint.]) near Albany, Ga. in 1967. Proc. Southeast. Pecan Grow. Assoc. 61:106-115. Dodine, Du-Ter, Brestan, and DuPont 1991 were tested as a control for scab. All four compounds gave excellent control during the tests, and all treatments were significantly better than the control.
  58. Cole, John R. 1968. One year's results of using aerial and ground applications of dodine/Du-Ter to control pecan scab (Fusicladium effusum [Wint.]). Proc. Southeast. Pecan Grow. Assoc. 61:117-139. In 1967, experiments for pecan scab control were conducted near Cordele, Ga., using dodine and Du-Ter applied with ground spray machines and airplanes. Weather conditions were unfavorable for scab development early in the season, and all spray treatments controlled the disease.
  59. Cole, John R. 1968. Dieback affecting pecan trees in southwest Georgia and north Florida. Plant Dis. Rep. 52:947-949. The writer has observed dieback caused by Botryosphaeria berengeriana de N. affecting the 'Teche' variety of pecan in southwest Georgia and north Florida. Chemicals failed to control the disease. Pruning is the only known control.
  60. Cole, John R. 1969. Control of crown gall, Agrobacterium tumefaciens, on pecans. Plant Dis. Rep. 53:712-713. Use of a solution of 400 ppm of 20% Terramycin for 4 years on bearing

- pecan trees infected with crown gall controlled all but a few galls.
61. Cole, John R. 1970. Antibiotic curbs pecan disease. p. 15. In USDA (ed.), Agric. Res. This paper reports the same data given by the author in No. 60.
  62. Cole, John R, and Gossard, A. C. 1956. Increased virulence of scab (Cladosporium effusum [Wint.] Demaree) on Stuart pecan in Mississippi and its presence in Louisiana. Plant Dis. Rep. 40:1120. The authors report pecan scab as serious on the nuts of the 'Stuart' variety in orchards near Laurel, Lumberton, and Fruitland Park and found traces of the disease on nuts near Gulfport.
  63. Cole, John R, and Gossard, A. C. 1956. Pecan scab (Cladosporium effusum) is causing injury to Stuart pecan nuts (at Lumberton and Hattiesburg, Miss.). Proc. Southeast. Pecan Grow. Assoc. 49:10-11. Pecan scab is reported from 'Stuart' pecans at Lumberton and Hattiesburg, Miss. The 'Stuart' variety was resistant to the disease for over 50 years but apparently the fungus adapted to the variety.
  64. Cole, John R, and Gossard, A. C. 1956. Stuart pecan found to be susceptible to scab in Mississippi. Plant Dis. Rep. 40:156. Pecan scab is reported as attacking the 'Stuart' variety in Mississippi. This variety had been resistant to scab for over 50 years but recently became susceptible.
  65. Cole, John R, and Hunter, J. H. 1962. Unusual case of delayed foliation and dieback of Moneymaker pecan. Plant Dis. Rep. 46:894-895. Twelve 'Moneymaker' pecan trees growing in an orchard near Fort Valley, Ga., were noted as smaller than other trees and also showed evidence of poorly developed terminals and some bud dieback. The cause of the disorder was never determined.
  66. Cole, John R., and Hunter, J. H. 1965. Abnormal flowering of pecans following freeze damage in 1955. Plant Dis. Rep. 49:146-147. Abnormal flowering of pecan trees is reported following a freeze in 1955. It was observed on seedlings as well as 'Schley', 'Stuart', 'Desirable', 'Farley', 'Moneymaker', 'Success', 'Pabst' and 'Mahan' varieties.
  67. Cole, John R., and Large, John. 1936. Progress report on pecan scab foliage diseases and rosette control for the season of 1936. Proc. Southeast Pecan Grow. Assoc. 31:39-53. The distribution, economic importance, and control measures of pecan scab, downy spot, brown leaf spot, leaf blotch and pecan rosette are briefly discussed. Scab, the most important of the pecan diseases, causes serious losses to such important varieties as the 'Schley', south of a latitude extending from Macon, Ga., through Montgomery, Ala., Meridian, Miss., and Alexandria, La. The control procedures for all of the listed diseases and schedules for application are included in the paper.
  68. Cole, John R., and Large, J. R. 1938. Recommendations for the control of scab and foliage diseases of pecans in the Southeast. United States Bureau Plant Industry Memo-graph Series, 4 pp. This is a popular publication that discusses the major diseases of pecans in the Southeast including pecan scab, downy spot, vein spot, leaf blotch, brown leaf spot, and liver spot. The economic importance, life cycle and controls are discussed. It is very similar to No. 67.
  69. Cole, John R., and Large, John. 1939. Resume of four years spraying Schley pecans with bordeaux mixture to control the scab disease. Proc. Southeast. Pecan Grow. Assoc. 33:16-26. Pecan scab, an infectious fungus disease, is one of the most limiting factors in nut production, especially in the Southeastern States. The fungus attacks the rapidly growing tissues of the nuts, twigs, and leaves of susceptible varieties, including 'Delmas', 'Alley', 'Schley', 'Pabst', 'Van Deman', and 'Success'. The 'Stuart', 'Teche', and 'Moore' varieties are very resistant to the disease. Sanitary measures, i.e., knocking old shucks and leaves from the trees and plowing them under will aid



- materially in controlling scab. A prepollination spray application consisting of 4-1-100 followed by three applications of 6-2-100 bordeaux mixture gives 85 to 95 percent, or commercial control, of the scab disease. This paper is similar to No. 70.
70. Cole, John R., and Large, John R. 1940. Resume of five years spraying of pecans with low-lime boardeaux mixture and zinc sulphate to control scab, foliage and rosette diseases. Proc. Southeast. Pecan Grow. Assoc. 34:16-26. Pecan scab, an infectious fungus disease, is one of the most limiting factors in nut production, especially in the Southeastern States. The fungus attacks the rapidly growing tissues of the nuts, shoots, and leaves of susceptible varieties, including 'Delmas', 'Alley', 'Schley', 'Pabst', 'Van Deman', and 'Success'. Sanitary measures, i.e., knocking old shucks, and leaves from the trees and plowing them under will aid materially in controlling scab. This paper is very similar to No. 69 and provides the same information in greater detail.
  71. Cole, John R., and Miller, P. W. 1950. Investigations of nut diseases. Plant Dis. Rep., Suppl. 195, pp. 433-444. This paper is a brief review of the diseases and physiological disorders found on pecan, walnut, filbert and Tung in the Southeastern States.
  72. Cole, John R.; Osburn, M. R.; Blackwell, C.; and Jordan, C. R. 1957. Control of pecan insects and diseases. Univ. Ga. Agric. Ext. Serv., Circ. 430, 2 pp. This is an extension service publication that contains insecticide and fungicide recommendations for Georgia in 1957.
  73. Cole, R. J.; Kirksey, J. W.; and Wells, J. M. 1974. A new tremorgenic metabolite from Penicillium paxilli. Can. J. Microbiol. 20:1159-1162. This paper reports the discovery of a new tremorgenic metabolite produced by Penicillium paxilli isolated from insect damaged pecans.
  74. Crane, H. L.; Hardy, Max B.; Loomis, N. H.; and Dodge, F. N. 1934. Growth and yield of pecan trees as affected by thinning the stand of trees and other orchard practices. Proc. Am. Soc. Hortic. Sci. 32:33-37. Experiments were conducted in which an orchard with 20 trees/acre and under good orchard practices received either (1) 30 lb. of commercial sulphate of ammonia per tree, (2) heavy pruning, or (3) thinning of trees to 10 per acre. Results showed that thinning of the stand was the only one that showed commercial possibilities. The additional yield from the sulphate of ammonia did not affect its cost and the production of nuts was greatly reduced or eliminated from severe pruning.
  75. Crane, H. L.; Hardy, Max B.; Loomis, N. H.; and Dodge, F. N. 1934. Effect of nut thinning on size, degree of filling and annual yields of pecan. Proc. Am. Soc. Hortic. Sci. 32:29-32. Experiments are reported in which nuts were removed from pecan trees in varying numbers. In general, the degree of filling of the nuts was found dependent on the number of leaves per nut. Thinning is cited as a possible way not only to increase the size, bloom, and degree of filling of the nuts but also may be expected to increase the annual yield per tree over a period of years by more nearly maintaining an optimum nutritional condition at all times.
  76. Cutler, H. G.; Cole, R. J.; Cox, R. H.; and Wells, J. M. 1979. Fungal metabolites: interesting new plant growth inhibitors. Proceedings Plant Growth Regulation Work Group, 67th, pp. 87-91. The possibilities of using fungal metabolites with selective properties to control growth or harmful organisms is discussed. Since these products would be readily metabolized in biological systems, they should leave no obnoxious residues in agricultural products.
- D
77. Demaree, J. B. 1924. Pecan scab with special reference to sources of the early spring infections. J. Agric.

Res. 28:321-333. Pecan scab is the most important disease on pecans and is known to exist in all the Southern States bordering the Atlantic Ocean or the Gulf of Mexico and Arkansas. There is a wide variation in the degree of susceptibility of the different cultivated pecan varieties to the scab disease. The disease is known to attack the nuts, twigs, leaves, dormant buds, and catkins. Very little, if any, damage is done to the buds and catkins. The greatest damage is to the nuts that may have become undersized, faulty, or rendered entirely worthless. Hygienic measures tend to eliminate the various sources of the early spring infections and are very important as a means of keeping the disease within bounds so that spraying will be effective. Twig lesions can be largely prevented by thorough summer spraying. The most practical method of disposing of the infected leaves and shucks after they fall to the ground is the thorough plowing under of these parts during late winter. Of the various available spray materials tried, bordeaux mixture was the most effective, although it sometimes causes serious injury to the foliage.

78. Demaree, J. B. 1925. Some apparent limitation to pecan scab control. *Am. Nut J.* (Rochester, N.Y.), pp. 25-28. The limitation imposed on scab control because of the unavailability of suitable sprayers in large orchards is discussed. Most producers during this time were using peach or apple sprayers which would not give coverage. The advantages of a dust over spray is discussed.
79. Demaree, J. B. 1926. The little leaf disease of pecans. *Phytopathology* 16:277-283. A disease affecting the leaves and twigs of the pecan tree is named "little leaf". Affected leaves, as a rule, are composed of a reduced number of leaflets, averaging about eight to the leaf and sometimes reduced to two. Affected leaflets are oblong or rounded, often with obtuse or notched apices, and frequently are greatly reduced

in size. Affected twigs are slender, lacking in vitality, and have small and blunt buds. This condition of pecan trees has been found in Savannah and Darien, Ga., Gainesville and Miami, Fla., Troy, Ala., and Ocean Springs and Biloxi, Miss. The disease has been found only within city limits and never under orchard conditions. Unsuccessful attempts were made to transmit the disease by budding and grafting. A badly affected tree transplanted to a location approximating field conditions entirely recovered.

80. Demaree, J. B. 1926. The pecan scab fungus. (Abstr.) *Phytopathology* 16:642-643. This paper is an abstract that proposes the transfer of the pecan scab organism from the genus Fusicladium to Cladosporium.
81. Demaree, J. B. 1928. Morphology and taxonomy of the pecan scab fungus, Cladosporium effusum (Wint.) comb. nov. *J. Agric. Res.* 37:181-187. This paper is a full length version of No. 80 and proposes the change of the scab organism from the genus Fusicladium to Cladosporium. The genus Fusicladium, according to the description by Bonorden, its author, should include only those forms of the Dematiaceae forming one-celled conidia singly or in pairs on short conidiophores. The result of this study demonstrates that the pecan scab fungus forms its conidia in either simple or branched chains. The number of conidia in a chain seems to vary from two to nine and probably averages four or five.
82. Demaree, J. B. 1931. Diseases of pecans in the Southern States, U.S. Dep. Agric. Farmers' Bull. 1129, 28 pp. This bulletin was written as an aid to nursery operators, growers, and prospective growers. All of the identified diseases of the 1930 period are discussed with controls given.
83. Demaree, J. B., and Cole, J. R. 1926. Commercial control of pecan scab. U.S. Dep. Agric. Circ. 386, 8 pp. This is a general paper that discusses all aspects of the disease including a description, distribution, economic importance, susceptibility of varieties, and controls.



84. Demaree, J. B., and Cole, J. R. 1927. Dusting with monohydrated copper sulphate and lime for control of pecan scab. U.S. Dep. Agric. Circ. 412, 6 pp. A mixture of monohydrated copper sulfate and lime dust effectively controlled pecan scab in two localities during the summer of 1926.
85. Demaree, J. B., and Cole, J. R. 1929. Behavior of Cladosporium effusum (Wint.) Demaree on some varieties of pecan. J. Agric. Res. 38:363-370. The experiments reported in this paper shows that when scab inoculum was taken from one variety and inoculated on young leaves of the same variety and on leaves of the same age of another variety, a heavy infection resulted on the original host and a light infection or none on the other. This tends to explain why two extremely susceptible pecan varieties may grow in the same orchard, even with their branches interlocked, and one variety may be attacked by the parasite while the other is not. The writers interpret such occurrences to mean that only one physiologic form of the fungus was introduced in that orchard. This also explains why 'Pabst', a variety extremely susceptible to the disease in southern Alabama and southern Mississippi, is free from the disease near Albany, Ga., where the 'Georgia', 'Delmas', 'Schley', and 'Alley' varieties are badly scabbed.
86. Demaree, J. B., and Cole, J. R. 1930. Pecan leaf blotch. J. Agric. Res. 40:777-789. Leaf blotch, a disease of pecan leaves caused by the fungus Mycosphaerella dendroides (Cke.) comb. nov., is known to occur in Georgia, Florida, Alabama, Mississippi, Louisiana, and Indiana. The disease is rapidly increasing in importance and seems to be extending its range of distribution. It is also known to occur in South Carolina and Georgia on other species of Hicoria. The conidial stage of the fungus which attacks mature leaves of the host during the latter half of the season is here considered identical with Cercospora halstedii E. and E. The morphological characters of the conidial, phynidial, and ascogenous stages are described in this paper. A preliminary experiment indicated that monohydrated copper sulfate and lime dust will effectively control the disease and that midsummer treatments are the most important.
87. Demaree, J. B., and Cole, J. R. 1932. The downy spot of pecans. J. Agric. Res. 44:139-146. The conidial stage of the downy spot disease of pecans is considered identical with Cercospora caryigena a fungus first described by Ellis and Everhart as Cylindrosporium caryigenum. Conidia are produced in great numbers on lesions and form white spots 2 to 5 mm in diameter on the lower surface of affected leaves. When the conidia are washed off by rains the lesions appear as inconspicuous yellow or brown spots. The disease has been observed on pecans in Georgia, Florida, Alabama, Mississippi, Louisiana, Arkansas, and Texas. The perfect stage, Mycosphaerella caryigena comb. nov., develops on pecan leaves during fall and winter but does not mature until early spring. Proof of the relationship of the conidial and perfect stages and of their pathogenicity was demonstrated by comparison on artificial media and by inoculation experiments. A description of the fungus and its growth on culture media is given.
88. Demaree, J. B., and Cole, J. R. 1935. A disporous Gnomonia on pecan. Phytopathology 26:1025-1029. A spotting of pecan foliage caused by a fungus, previously reported by Matz, is described. Matz did not suggest a specific name but referred to it as Gnomonia sp. nov., and it is described here as Gnomonia dispora sp. nov. Perithecia form and mature in necrotic areas on the living leaves in late summer. No conidial stage has yet been found. Normal perithecia, asci, and spores were grown on a mixture of cornmeal and potato agar in about 20 days at the optimum temperature of 24° to 26° C.

89. Demaree, J. B.; Fowler, E. D.; and Crane, H. L. 1933. Report of progress on experiments to control pecan rosette. Proc. Natl. Pecan Assoc. 32:90-99. The history, symptoms, and cure of rosette on pecan are discussed in detail. The best control is cited as a spray of zinc salt on the leaves of growing shoots.
90. Demaree, J. B., and Large, J. R. 1934. Some injurious effects of bordeaux mixture on pecan trees. Proc. Southeast. Pecan Grow Assoc. 27: 20-29. The injurious effects of using bordeaux mixture on pecans are cited as (1) severe injury to very young leaves, (2) irregular or angular brown spots and discolored or dead margins on tips of the leaflets, (3) wilting of the nuts followed by yellowing and abscission of the leaves, and (4) the buildup of black pecan aphid infestations. Despite these disadvantages, bordeaux mixture is still cited as the most effective control for pecan scab.
91. Dowler, W. M.; Nesmith, W. C.; and Weaver, D. J. 1974. Influence of site and pruning date on element content of dormant peach trees. (Abstr.) HortScience 9:303. Element content was determined in peach twigs and roots collected at intervals during dormancy. The results are presented in detail in No. 599.
92. Dowler, W. M., and Weaver, D. J. 1972. Characterization of green fluorescent pseudomonads isolated from apparently healthy, dormant peach trees. (Abstr.) Phytopathology 62:754-755. These studies indicate that heterogeneous populations of pseudomonads may exist in dormant peach trees in the Southeastern United States. These data are presented in a full-length paper (No. 94).
93. Dowler, W. M., and Weaver, D. J. 1973. Virulence of Pseudomonas syringae in fall-pruned peach trees in the Southeastern United States. (Abstr.) Proc. Int. Congr. Plant Pathol., 2nd, paper no. 1050. These data are presented as a full-length paper (No. 94).
94. Dowler, W. M., and Weaver, D. J. 1975. Isolation and characterization of fluorescent pseudomonads from apparently healthy peach trees. Phytopathology 65:233-236. Pathogenic and nonpathogenic fluorescent pseudomonads were readily isolated from apparently healthy peach twig and trunk tissue samples collected monthly in Georgia and South Carolina. No pathogenic bacteria were isolated during the summer months. Morphological and biochemical tests showed that the pathogenic isolates were closely related to Pseudomonas syringae, but about 50% of the fluorescent isolates were nonpathogenic. Inoculation of mature trees in the field with these isolates during early fall pruning resulted in death of trees by the following March. Heterogeneous populations of pseudomonads exist in apparently healthy peach orchards in the Southeastern United States.
95. Downs, S. W.; Payne, J. A.; and Spann, G. W. 1976. Utilization of infrared imagery in studying peach tree decline in Georgia. Remote Sensing of Earth Resour. 5:349-355. Automatic processing of color infrared photography is successfully used to identify declining peach trees in their early stages of decline.
96. Dutcher, J. D., and Payne, J. A. 1979. Bionomics and control of pecan leafminers. Proc. Southeast. Pecan Grow. Assoc. 72:143-146. Initial sampling data from the variety grove at the Coastal Plain Experiment Station in Tifton indicate varietal differences in relative abundance of leafminers in the foliage. Stigmella juglandifoliella and Lithocolletis caryaefoliella were more abundant in 'Schley' and 'Moneymaker' than in 'Stuart'. L. caryaefoliella and Coptodisca lucifluella were more abundant in 'Schley' than in 'Moneymaker' or 'Stuart'. In addition, leafminers of S. juglandifoliella, L. caryaefoliella, and C. lucifluella were more abundant in the lower than in the upper foliage, whereas L. caryaefoliella mines were evenly distributed in the crown. All four species were evenly distributed in the four cardinal quadrants of the foliar crown.



97a. Dutcher, J. D., and Payne, J. A. 1980. 1979 insecticide evaluation results for pecans in Georgia. Proc. Southeast. Pecan Grow. Assoc. 73:55-59. Data for insecticide tests conducted on pecan during 1979 in Georgia are given. Tests included foliar application as well as trunk injections.

97b. Dutcher, J. D., and Payne, J. A. 1981. Pecan weevil (Curculio caryae, Coleoptera: Curculionidae) bionomics: A regional research problem. Misc. Publ. Entomol. Soc. Am. 12:45-68. This paper reviews 58 publications on pecan weevil during 1973-1979 and also reports results of weevil emergence from three fields in Georgia during 1979. The literature review indicated significant intra-regional variability in the occurrence of adult emergence from the soil, onset of oviposition, and larval emergence from the pecan. Rainfall, soil moisture, and soil penetration resistance were associated with the emergence patterns of adult weevils. The stages of nut maturity dictated the onset of successful oviposition.

## E

98. Edwards, J. H., and Horton, B. D. 1976. Aluminum induced calcium deficiency in peach seedlings. Ga. Agron. Abstr., paper no. 19. These data are presented by the authors in a full-length paper (No. 99).

99. Edwards, J. H., and Horton, B. D. 1977. Aluminum induced calcium deficiency in peach seedlings. J. Am. Soc. Hortic. Sci. 102:459-461. Total nutrient content, uptake rates, and distribution were determined for peach seedlings grown in nutrient solutions containing 0, 222, 666, and 2000  $\mu\text{M}$  Al. Generally, total nutrient content decreased in the peach seedling organs as Al concentration increased. The responses obtained with increased Al concentration were linear with some nutrients and curvilinear with others and varied with plant organ. As Al concentration increased, the uptake rates for P, Ca, Mg, Zn, and

Mn decreased but those for K and Fe increased. Aluminum did not alter the translocation of most nutrients; however, a greater percentage of the absorbed Ca accumulated in the leaves than in the roots or stems. Thus, aluminum toxicity in peaches may be related to a reduction in Ca uptake rate and not to inhibition in translocation of Ca.

100. Edwards, J. H., and Horton, B. D. 1979. Response of peach seedlings to calcium concentration in nutrient solution. J. Am. Soc. Hortic. Sci. 104:97-99. Peach seedlings grown in nutrient solutions containing various amounts of Ca showed varying symptoms. At 0.8,  $\mu\text{M}$  Ca root growth was reduced, and roots became brown, appeared gelatinous, and decayed before any foliar Ca deficiency symptoms developed. Ca deficiency symptoms in 2.5  $\mu\text{M}$  Ca developed in the leaves as marginal chlorosis followed by necrosis that spread to the leaf apices. Reduced root growth was the only indication of Ca deficiency in seedlings grown in 7.5  $\mu\text{M}$  Ca. No deficiency symptoms appeared in seedlings grown in Ca concentrations greater than 7.5  $\mu\text{M}$ .

101. Edwards, J. H., and Horton, B. D. 1981. Influence of N and K rates on nutrient contents of tissue from high density peach planting during growing season. (Abstr.) HortScience 16:282. 'Coronet' peaches were planted 3 by 317 m and compared to spacing of 6.1 by 6.1 m. Nitrogen 31, 61, or 122 kg/ha were applied annually. Nitrogen was applied in split applications of one-half in March and one-half in June. Leaf and stem samples were collected bimonthly May 1 to Aug. 1 and Sept. 1. Concentration of N and K in the leaves decreased with each sample until Sept. 1. Concentrations of Ca decreased until fruit harvest and then increased until Sept. 1. Concentrations of Mg increased in leaves for each sample date. In the stems, N, K, and Mg concentrations decreased until harvest and then increased for each sample date afterward. Calcium concentration increased until the July 15 sample

- date and then decreased in the Aug. 1 and Sept. 1 sample dates.
102. Edwards, J. H., and Horton, B. D. 1981. Influence of magnesium concentrations in nutrient solution on growth, tissue concentration, and nutrient uptake of peach seedlings. *J. Am. Soc. Hortic. Sci.* 106:401-405. Seedlings of 'Babygold 5' peach were grown for 50 days in nutrient solutions of 0.4, 21, 42, 125, 250, and 500  $\mu\text{M}$  Mg. Magnesium deficiency symptoms were observed 19 days after initiation of the Mg treatments in the seedlings in 0.4  $\mu\text{M}$  Mg solutions. The relative growth rate was significantly increased for the first increment of Mg concentration with no further increases at higher Mg concentrations. Increasing Mg in the nutrient solution significantly increased Mg concentration in the leaves, stems, and roots, but Mg tissue concentration decreased at all levels of Mg in the nutrient solution as physiological age increased. Visible Mg deficiency symptoms were observed on mature leaves at the 125  $\mu\text{M}$  Mg treatment, but when the Mg concentration exceeded 250  $\mu\text{M}$ , Mg concentration in mature leaves was increased above the threshold for appearance of Mg deficiency symptoms. No Mg deficiencies were observed on 'Babygold 5' seedlings when the Mg concentrations in the leaves exceeded 2,000  $\mu\text{g/g}$  dry weight and Mg uptake rate was 2.5  $\mu\text{moles/g}$  fresh wt./day.
  103. Edwards, J. H.; Horton, B. D.; and Kirkpatrick, H. C. 1976. Aluminum toxicity symptoms in peach seedlings. *J. Am. Soc. Hortic. Sci.* 101:139-142. Peach seedlings grown in 2,000  $\mu\text{M}$  concentrations of Al showed Al toxicity symptoms in leaves and severely restricted root growth. A concentration of 666  $\mu\text{M}$  stimulated root growth but retarded shoot growth. Calcium was not detectable in the roots of seedlings grown at the higher Al concentrations.
  - G
  104. Gentry, C. R. 1981. Peachtree borer (Lepidoptera: Sesiidae): control by mass trapping with synthetic sex pheromone. *Misc. Publ. Entomol. Soc. Am.* 12:15-19. Field trials were conducted to determine whether the peachtree borer could be reduced with traps baited with its synthetic sex pheromone. Traps were evaluated at 2.5 traps/ha in two peach orchards, one with a high peachtree borer infestation, the other with a low infestation. Results showed that five traps/ha were more effective than 2.5 traps/ha, but both treatments gave better peachtree borer control than the conventional insecticide treatment regardless of insect density.
  105. Gentry, C. R.; Beroza, Morton; and Blythe, J. L. 1975. Pecan bud moth: captures in Georgia in traps baited with the pheromone of the oriental fruit moth. *Environ. Entomol.* 4:227-228. Pheromone-baited traps placed 9.1 m above the ground in pecan trees caught more male pecan bud moths than the traps placed at lower heights. In other tests, the Pherocon 1C trap was more effective in capturing moths during the spring but light traps with or without pheromone were more effective during the summer.
  106. Gentry, C. R.; Beroza, M.; Blythe, J. L.; and Bierl, B. A. 1974. Efficacy trials with the pheromone of the oriental fruit moth and data on the lesser appleworm. *J. Econ. Entomol.* 67:583-585. Nine trap designs baited with pheromone were tested for efficiency in capturing male oriental fruit and lesser appleworm moths. The Pherocon 1C trap with the bottom and top sections closed caught the most moths. Traps placed at 3 ft heights caught more males of both species than traps placed at any other heights. Attraction of the pheromone was enhanced by the addition of a synergist. A microencapsulated formulation of the pheromone



- dispersed in a peach orchard suppressed the trap capture of male oriental fruit moths for 2 weeks.
107. Gentry, C. R.; Beroza, Morton; Blythe, John L.; and Bierl, B. A. 1975. Captures of the oriental fruit moth, the pecan bud moth and the lesser appleworm in Georgia field trials with isomeric blends of 8-dodecenyl acetate and air-permeation trials with the oriental fruit moth pheromone. *Environ. Entomol.* 4:822-824. This paper compares captures of oriental fruit moths, the pecan bud moth, and the lesser appleworm in traps baited with the pheromone 8-dodecenyl acetate. Comparisons of the daily activity patterns are also made along with results from an air-permeation trial with the oriental fruit moth.
  108. Gentry, C. R.; Beroza, M.; and Payne, J. A. 1975. Pecan bud moth: attraction to pheromone of the oriental fruit moth. *Proc. Southeast. Pecan Grow. Assoc.* 68:107-113. Male pecan bud moths are reported as attracted to the pheromone [(Z)-8-dodecenyl acetate] of the oriental fruit moth. Two mls of the pheromone in a Pherocon 1C Trap placed 30 ft into the tree canopy was the most effective capture system tested. Large numbers of male moths were captured in April and May, but few moths responded from June to October.
  109. Gentry, C. R.; Bierl, B. A.; and Blythe, J. L. 1976. Air permeation field trials with the oriental fruit moth pheromone. *Proc. 1976 Int. Controlled Release Pestic. Symp.*, pp. 1-3. Field trials were conducted from 1973 to 1975 in which synthetic sex pheromone of the oriental fruit moth was dispersed by several methods in a 2-acre orchard of peaches. All pheromone treatments reduced the male capture in virgin-female-baited traps (male confusion), and twig damage was also reduced 51-100 percent.
  110. Gentry, C. R.; Bierl-Leonhardt, B. A.; Blythe, J. L.; and Plimmer, J. R. 1980. Air permeation tests with orfralure for reduction in trap catch of oriental fruit moths. *J. Chem. Econ.* 6:185-192. The pheromone 93% (Z)-7%(E)-8-dodecen-1-ol-acetate of the oriental fruit moth was tested in a laminated dispenser and as a microcapsulated formulation in various air permeation tests conducted in 1974-77. Control was measured by reductions in male capture in female baited traps and by reductions in twig damage. Both types of dispensers significantly reduced male captures in traps, but both were inconsistent in the reduction of damage.
  111. Gentry, C. R.; Bierl-Leonhardt, B. A.; McLaughlin, J. R.; and Plimmer, J. R. 1981. Air permeation tests with (Z,Z)-3,13-octadecadien-1-ol acetate for reduction in trap catch of peachtree and lesser peachtree borer moths. *J. Chem. Econ.* 7:575-582. Air-permeation trials were conducted to determine whether trap catches of the peachtree borer and lesser peachtree borer could be reduced through application of the synthetic pheromone (Z,Z)-3,13-octadecadien-1-ol acetate (Z,Z-ODDA). Results showed that all formulations of Z,Z-ODDA reduced trap catches of both peachtree borer and lesser peachtree borer in treated plots relative to catches in traps in untreated plots.
  112. Gentry, C. R., and Blythe, J. L. 1978. Lesser peachtree borers: a device for trapping, collecting and marking native moths. *J. Environ. Entomol.* 7:783-784. A trapping, collecting, and marking device was designed and constructed for processing large numbers of native male lesser peachtree borers and peachtree borers in the field. The device eliminated many of the steps involved in marking moths with fluorescent pigments for large area movement and dispersal study.
  113. Gentry, C. R.; Blythe, J. L.; and Wehunt, E. J. 1974. Control of aphids and certain other pecan pests with soil treatments of disulfoton. *J. Econ. Entomol.* 67:419-420. Disulfoton effectively controlled Monellia spp. and black

- pecan aphids and had an effect on populations of the serpentine leafminer and spittlebug. These data have also been published in No. 122.
114. Gentry, C. R.; Blythe, J. L.; and Yonce, C. E. 1976. A time interval trapping device for surveying with pheromones. *Environ. Entomol.* 5:1062-1064. A time-trapping device was designed and constructed that would capture and separate insects attracted to pheromones at any desired time interval.
  115. Gentry, C. R.; Bowden, L. B.; Payne, J. A.; and Tedders, W. L. 1973. A bibliography of the pecan weevil, Curculio caryae (Coleoptera: Curculionidae). *Bull. Entomol. Soc. Am.* 19:203-207. This paper is a listing of scientific papers published on the pecan weevil for the 100-year period 1873-1973.
  116. Gentry, C. R.; Hart, W. G.; Kaloustian, G. H.; Moffitt, H. R.; and Selheim, A. G. 1979. Fruit pests: In Guidelines for the Control of Insect and Mite Pests of Food, Fibers, Feeds, Ornamentals, Livestock, Forest and Forest Products. U.S. Dep. Agric. Agric. Handb. 554, 822 pp. This paper is a listing of the insecticides recommended by the USDA for control of fruit pests during 1979.
  117. Gentry, C. R.; Hart, W. G.; Kaloustian, G. H.; Moffitt, H. R.; and Selheim, A. G. 1980. Fruit pests: In Guidelines for the Control of Insect and Mite Pests of Food, Fibers, Feeds, Ornamentals, Livestock, Forest and Forest Products. U.S. Dep. Agric. Agric. Handb. 571, 796 pp. This paper is a listing of the insecticides recommended by the USDA for control of fruit pests during 1980.
  118. Gentry, C. R.; Malstrom, H. L.; and Blythe, J. L. 1974. Trends in seasonal occurrence of yellow pecan aphids. *Pecan South* 1:21. These data are given in greater detail by the authors in Nos. 119 and 120.
  119. Gentry, C. R.; Malstrom, H. L.; and Blythe, J. L. 1975. Georgia tests show aphid preferences. *Pecan Q.* 9:20-21. Aphid populations on pecan trees did not significantly vary based on location when considered on a north, east, south and west basis. However, the population did vary significantly based on height, a decrease occurring progressively with increasing height. The seasonal aphid populations were similar on 'Stuart' and 'Schley' varieties with population highs in early (May) and late (September) season. Extremely low levels were found in midsummer.
  120. Gentry, C. R.; Malstrom, H. L.; and Blythe, J. L. 1975. Sampling populations of yellow pecan aphids in relation to tree variety, height, quadrant and season. *Pecan South* 2:24-25. This paper is the same as that published in Nos. 118 and 119.
  121. Gentry, C. R.; Payne, J. A.; and Simonaitis, R. A. 1981. Soil treatment with aldicarb against several insect pests of pecans. *J. Ga. Entomol. Soc.* 16:261-265. In field tests in 1977 at Byron, Ga., aldicarb applied to the soil surface around pecan trees significantly reduced populations of the yellow pecan aphids, Monellia costalis (Fitch) and Monelliopsis nigropunctata (Granovsky), and the black pecan aphid, Tinocallis caryaefoliae (Davis) and also reduced damage to pecan leaflets. In comparison with rates of 0.37 and 0.73 kg, the rate of 1.45 kg active ingredient/tree gave the best control of the hickory shuckworm and pecan weevil; values were highest for leaf retention and yield and quality of nuts. Residues of aldicarb were detected by gas chromatographic analysis at all rates, but levels were below the established tolerance.
  122. Gentry, C. R.; Polles, S. G.; and Blythe, J. L. 1974. Control of pecan aphids with soil applied systemic insecticides with some data on the pecan spittlebug and a serpentine leafminer. *Proc. Southeast. Pecan Grow. Assoc.* 67:99-107. A formulation of disulfoton EC injected into the soil and a granular formulation of the same



- material applied to the soil surface significantly reduced populations of the yellow pecan aphid. The granular application also controlled a serpentine leafminer and the pecan spittlebug. Granular formulations of aldicarb and carbofuran applied to the soil surface were also effective in reducing populations of the yellow and black pecan aphids.
123. Gentry, C. R.; Polles, S. G.; and Blythe, J. L. 1974. Systemics for aphid control. *Pecan South* 1:10-12. These data were also published by the authors in No. 122.
  124. Gentry, C. R.; Sekul, A. A.; and Yonce, C. E. 1972. Attractiveness of the sex pheromone of the peach-tree borer (Lepidoptera:Aegeriidae) in field tests; its locus of emission, its extraction. *J. Ga. Entomol. Soc.* 7:247-249. Field tests in 1970 using wing sticky traps demonstrated the attractiveness of live virgin females and of the extracts of their abdominal tips and that the sex pheromone of virgin peachtree borer females was localized only in the tips of the genital segments and that it was extractable in pentane but not methanol.
  125. Gentry, C. R.; Simonaitis, R. A.; and Zehner, J. M. 1976. Control of pecan aphids on mature pecan trees with aldicarb. *J. Econ. Entomol.* 69:523-526. Granular formulations of aldicarb applied to the soil surface were found to significantly reduce populations of the blackmargined aphid, of Monelliopsis nigropunctata, and of the black pecan aphid. The most effective rate was 0.8 lb actual/tree applied in May for the blackmargined aphid and M. nigropunctata and in July for the black pecan aphid. No residues of aldicarb or its metabolites were found by gas chromatographic analysis.
  126. Gentry, C. R.; Simonaitis, R. A.; Zehner, J. M.; and Polles, S. G. 1977. Aldicarb for pecan aphid control. *Pecan South* 4:8-11. This paper contains the same data published in No. 125.
  127. Gentry, C. R.; Smith, J. S., Jr.; Blythe, J. L.; and Edwards, G. W. 1975. Blacklight traps to control hickory shuckworm on pecan. *Pecan South* 2:203-205. These data were also published by the authors in Nos. 128 and 129.
  128. Gentry, C. R.; Smith, J. S., Jr.; Blythe, J. L.; and Edwards, G. W. 1975. Blacklight lamp provides alternatives to insecticides. *Pecan Q.* 9:10-12. This paper contains the same data as that published in Nos. 127 and 129.
  129. Gentry, C. R.; Smith, J. S., Jr.; Blythe, J. L.; and Edwards, G. W. 1976. Blacklight traps to control hickory shuckworms on pecan. *U.S. Dep. Agric. Agric. Res. Serv. [Rep.] ARS 105*, 4 pp. In 1971 and 1972 results were obtained in an 8 acre pecan orchard that showed one to two, 6-watt Tedders tree traps per acre suppressed the hickory shuckworm below an economic level. The level of suppression was equal to that obtained in other years using the more expensive 15-watt survey traps.
  130. Gentry, C. R.; Smith, J. S.; Hunter, R. E.; Payne, J. A.; and Wells, J. M. 1977. The second year of an integrated program for pest management on pecans. *Proc. Southeast. Pecan Grow. Assoc.* 70:155-163. This paper reports the second year results of the integrated pest management program conducted in a 50 acre pecan orchard near Fort Valley, Ga. During 1976 the spray orchard had better insect control than the conventionally treated orchard except for the hickory shuckworm. Even though there was less scab control in the integrated pest management orchard, the yield and quality of harvested nuts was higher.
  131. Gentry, C. R.; Smith, J. S.; Hunter, R. E.; Payne, J. A.; and Wells, J. M. 1977. The second year of an integrated program for pest management on pecans. *Proc. Annu. Conf. Ga. Pecan Grow. Assoc.*, 12th, 8:63-75. This paper was also published by the authors in No. 130.

132. Gentry, C. R.; Smith, J. S.; Hunter, R. E.; Payne, J. A.; and Wells, J. M. 1978. The third year of an integrated program for pest management on pecans. *Proc. West. Irrig. Pecan Grow. Assoc.*, 12th, pp. 31-41. This paper reports third year results of the integrated pest management program conducted in a 50 acre pecan orchard near Fort Valley, Ga., during 1977. Insect control in both the IPM orchard and the conventional orchard differed only slightly. There were fewer aphids and less shuckworm damage in the IPM orchard, while in the conventional orchard, weevil infestations were somewhat less. However, the EDB treatment applied in 1975 still gave excellent control over weevil emergence in the IPM orchard. Also, leafminers were less numerous in the IPM orchard. Spider mite populations were higher in the IPM orchard, but at no time during the year did they offer any serious threat to leaves. Damage was virtually undetectable. The fungicide programs, both extended and conventional, gave excellent scab control (100% commercial).
133. Gentry, C. R.; Smith, J. S., Jr.; Payne, J. A.; Wells, J. M.; and McGlohon, N. 1976. The first year of an integrated program for pest management on pecan. *Proc. Southeast. Pecan Grow. Assoc.* 69:125-131. An integrated pest management program was initiated in 1975 near Fort Valley, Ga., in a 50-acre commercial orchard that included blacklight traps, a soil systemic insecticide, a soil fumigant, and higher rates of fungicide at extended time intervals. The results of 1 year were promising in that no extreme differences in yield resulted when compared with an orchard receiving a conventional spray program.
134. Gentry, C. R.; Yonce, C. E.; Blythe, J. L.; and Tumlinson, J. H. 1979. Lesser peachtree borer: recovery of marked males in pheromone baited traps. *Environ. Entomol.* 8:218-220. The average recovery rate of male peachtree borers released in an 800-ha area (1 trap/6.5 ha) was 20.3 percent; however, 97 percent of these were recaptured in 15 traps located within a 0.6-km radius of the release point. A calculated 16.6 percent of the native male population in the area was captured.
135. Gentry, C. R.; Yonce, C. E.; Tumlinson, J. H.; and Blythe, J. L. 1977. Capture of male lesser peachtree borers and peachtree borers at pheromone sources in the field. *J. Ga. Entomol. Soc.* 12:145-150. The daily activity periods of the lesser peachtree borer and the peachtree borer are strongly related to both time and temperature. In general, the best capture combination for males of the lesser peachtree borer was 26° at 10-11 a.m. The best capture for peachtree borer was at 28° between 12-1 p.m. The synthetic pheromone was more attractive to both male types than were traps baited with virgin female moths.
136. Gill, J. B. 1914. Our foes among the insects. *Proc. Annu. Conv. Natl. Nut Grow. Assoc.*, 13th, pp. 48-52. This paper contains a short introduction about the pecan leaf casebearer and its control that is followed by questions and answers about the pecan weevil, shuckworm, twig girdler, walnut caterpillar, and woodborers.
137. Gill, J. B. 1917. Important pecan insects and their control. *Farmers' Bull.* 843, 48 pp. This bulletin is intended for farmers' use and discusses all the important insects attacking pecans. Life cycle, biologies, damage, and economic importance along with controls recommended in the early 1900's are included.
138. Gill, J. B. 1923. The pecan nut case-bearer. *Proc. Ga.-Fla. Pecan Grow. Assoc.*, 17th, pp. 10-13. The pecan nut case-bearer, a new pest in the Southeast, is discussed along with control using arsenate sprays.
139. Gill, J. B. 1924. The pecan nut case-bearer. *Proc. Ga.-Fla. Pecan*



Grow. Assoc., 18th, pp. 35-41. This is a very comprehensive paper on the pecan nut case-bearer and gives the life history, distribution, host range, injury, seasonal history, natural enemies, and control of the species.

- 140a. Gill, J. B. 1925. Control of pecan leaf case-bearers and nut case bearers. Proc. Ga.-Fla. Pecan Grow. Assoc., 19th, pp. 36-41. A few introductory statements are made about the pecan leaf case-bearer and its control, and then a series of questions and answers are presented about the insect.

- 140b. Gottwald, T. R. and Bertrand, P. F. 1981. Diurnal and seasonal discharge pattern of conidia of the pecan scab fungus Fusicladium effuseum and its impact on an epidemic. Proc. Southeast. Pecan Grow. Assoc., 74th, pp. 137-142. Spore release in Georgia was shown to start in late April of 1980 and continue through late November. Daily air-borne spore counts decreased just before and during "moderate to heavy" rain periods, but increased immediately following intermittent rain periods. During prolonged intermittent rain periods spore releases tended to peak during the first few days then gradually fall off. Prolonged periods of drought inhibited spore release. A dependence was also shown for light in that conidia were first released at sunlight. In general spore releases corresponded to valleys between leaf wetness peaks.

141. Gray, L. B.; Neel, W. W.; and Payne, J. A. 1975. The use of polyvinyl acetate as a barrier to the pecan weevil larvae. Pecan South 2:194-196. An experiment was conducted to determine the effectiveness of poly-vinyl acetate applied to a pecan orchard floor as a method to prevent the penetration of pecan weevil larvae into the soil. When it was applied in a  $\frac{1}{2}$  layer to soil that had been disked, raked, and smoothed with all debris removed, it was 100 percent effective. The cost makes the method

impractical; however, the author promises additional research.

## H

142. Hammer, H. E., and Hunter, J. H. 1946. Some physical and chemical changes in the composition of pecan nuts during kernel filling. Plant Physiol. 21:476-491. A systematic sampling of pecan nuts was made at nine weekly intervals during kernel development to determine chemical changes in the mineral constituents. The most important stage in the development of the shuck and shell of the pecan was the prefilling period during which 92.1 percent of the dry weight of the shell had been formed, while only 22.4 percent of the dry weight of the kernel was evident. The most critical period in the filling of the kernel was the period before Sept. 15 when about 96 percent of the protein, 82 percent of the oil, 85 percent of the dry weight, and 84 percent of the ash of the kernel at maturity date were formed. During the 3-week period from Aug. 25 to Sept. 15, 63 percent of the total dry weight, 64 percent of the total oil, 43 percent of the total ash, and 71 percent of the total protein were formed in the kernel, which indicated the rapidity of the changes that took place.
143. Hammer, H. E., and Hunter, James H. 1949. Influence of fertilizer treatment on the chemical composition of 'Moore' pecan leaves during nut development. Plant Physiol. 24:16-30. Pecan leaves from four differently treated fertilizer plots were sampled for chemical analyses at six samplings during the development and early filling period of the nut. Very striking seasonal changes in the chemical composition of the leaves occurred for all fertilizer plots. In general, nitrogen, phosphorus, and potassium were found to decrease more or less rapidly during the entire period, while calcium accumulated at an equally rapid rate.

144. Hardy, Max B. 1947. Progress report on attempts to control biennial bearing in pecan. Proc. Southeast. Pecan Grow. Assoc. 40:54-62. A series of chemicals was applied to pecan trees in an effort to find a thinning compound that would prevent or eliminate a heavy set of nuts. No effective material was found.
145. Hardy, Max B. 1949. The future of the Chinese chestnut industry in the Southeast. North. Nut Grow. Assoc. Ann. Rep., 40th, pp. 135-138. The Chinese chestnut and its future as a replacement for the American chestnut are discussed. Its suitability as a crop in the Southeast is stressed.
146. Hardy, Max B., and Lutz, Harry. 1940. Factors associated with the drop of pecan nuts. Proc. Southeast. Pecan Grow. Assoc. 34:77-81. The factors involved in causing nut drop, ranging from physiological disorders, insects, diseases and poor nutrition, are discussed.
147. Havis, Leon; Weinberger, J. H.; and Hesse, C. O. 1943-47. Better peaches are coming. U.S. Dep. Agric. Yearb. Agric. 1943-47, pp. 305-311. The peach breeding programs in the United States, both State and Federal, are discussed in detail.
148. Hayden, R. A.; Savage, E. F.; and Prince, V. E. 1968. Growth of young peach trees as affected by preplant fumigant treatments. Am. Soc. Hortic. Sci. 93:119-127. The effect on the growth and survival of peach trees of a series of fumigant treatments was studied. Trees treated with Fumazone, ethylene dibromide, and methyl bromide were significantly larger than the untreated trees at the end of four growing seasons. When applied at high rates, Telone- and Dorrone-treated plots also produced trees larger than the check. Plots treated with ureaformaldehyde produced the smallest trees.
149. Hedin, P. A.; Payne, J. A.; Carpenter, T. L.; and Neel, W. W. 1979. Sex pheromones of the male and female pecan weevil, Curculio caryae: behavioral and chemical studies. Environ. Entomol. 8:521-523. Male and female pecan weevils were shown to be attractive to the respective opposite sex in a newly developed laboratory bioassay. Extracts of males attracted females and vice versa. (Z)-3,3-Dimethyl- $\Delta^{1,B}$ -cyclohexaneethanol (Cpd II of the pheromones of the boll weevil) was isolated from an active extract of females and was shown to possess some attractiveness to both sexes in a field bioassay.
150. Holloway, R. L.; Childers, Stanley; Tumlinson, J. H.; and Yonce, C. E. 1977. Trapping the lesser peachtree borer with (E,Z)3,13-octadecadien-1-ol acetate. J. Ga. Entomol. Soc. 12:365-368. Zoecon's Pherocon 1C pheromone traps were found to lose their effectiveness with time while lure placement in the traps had no effect on male capture. A new trap utilizing a 7 oz Styrofoam cup is described and was shown more efficient than the Zoecon trap.
151. Horton, Billy D. 1971. Results with high density peach plants. Proc. Annu. Conv. Natl. Peach Council., 30th, pp. 94-96. Increasing tree populations from 108 to 350-400 trees/acre is recommended for 2 reasons- (1) the usual reduction in tree numbers for short life and (2) increasing yields in the first 2 years. Data are presented that give preliminary evidence that high density plantings trimmed into 18- to 24-inch walls increase both yield and profit.
152. Horton, Billy D. 1972. Training high density plantings for mechanizing peach production. Proc. Annu. Conv. Natl. Peach Council., 31st, pp. 76-78. Data are presented for 1972 that show high-density wall-type planting significantly outyielding the conventional type. The wall system is cited as likely unsuitable for mechanical harvesting and a Y configuration is proposed and discussed. Pruning, spraying, and mechanical harvest of fruit is discussed in detail.
153. Horton, Billy D. 1973. Training peaches for mechanization. Proc.



- Annu. Meet. Ark. State Hortic. Soc., 94th, pp. 93-96. The Y-shaped tree system is discussed along with a proposed mechanical harvesting system that was later developed. The author points out that 89 percent of an orchard is covered by fruiting surfaces with a Y-system, while only 63 percent would be covered in the conventionally pruned 20- by 20-ft spacing.
154. Horton, Billy D. 1973. Peach tree short life in the Southeast. Proc. Annu. Meet. Ark. State Hortic. Soc., 94th, pp. 109-114. This is a general review of the short life problem in the Southeast. The 10-point program developed in Georgia for short life is covered in detail.
  155. Horton, Billy D. 1975. Training high density plantings for mechanizing peach production. In Norman F. Childers (ed.), *The Peach*, pp. 119-122 (first revised edition), pp. 238-241 (second revised edition). Horticultural Publications, New Brunswick, N.J. 1974, 1975. A report is given on results from high-density peach trees sheared as tree walls about 24 to 30 inches wide and 9 ft high. The yields on 4-year-old 'Dixieland' trees spaced 6, 9, or 12 by 14 ft were 497, 491, and 452 bu per acre, respectively, compared with 256 bu from 20- by 20-ft spacing. Trees at the 9- by 14-ft spacing almost doubled yields of those at the conventional 20- by 20-ft spacing, and almost equaled yields of those at the 6- by 14-ft spacing.
  156. Horton, Billy D., and Edwards, J. H. 1975. Effects of aluminum concentrations on diffusive resistance rates of peach seedlings. (Abstr.) HortScience 10:343. Greenhouse tests with peach seedlings grown in one-fifth concentration of Hoagland solution with Al rates of 18 and 54 ppm showed leaf chlorosis. Diffusive resistance in the leaves also increased significantly.
  157. Horton, Billy D., and Edwards, J. H. 1976. Diffusive resistance rates and stomatal aperture of peach seedlings as affected by aluminum concentration. HortScience 11:591-593. Peach seedlings were grown in nutrient solutions containing 0, 222, 666, 1,333, or 2,000  $\mu\text{m Al}$ . Diffusive resistance increased as Al concentrations increased and stomatal apertures were largest on seedlings grown in 666  $\mu\text{m}$ . Stomatal apertures in check and 2,000  $\mu\text{m Al}$  were the smallest. Root volume decreased as Al concentrations increased.
  158. Horton, Billy D., and Edwards, J. H. 1981. Production of Y shaped peach trees trained for complete mechanization. (Abstr.) HortScience 16:282. 'Coronet' peaches planted in 1975 were spaced 3 by 3.7 m apart and trained into a Y-shape for production comparison with others spaced 6.1 by 6.1 m apart trained as standard trees. The Y marketable yields, 25 and 36 t/ha in 1979 and 1980 were about double that of standard trees, 15 and 14 t/ha. The Y-system appears to be suitable for an over-the-row tractor for pruning and harvesting.
  159. Horton, Billy D.; Edwards, J. H.; Wehunt, E. J.; Bruce, R. R.; and Chessness, J. L. 1981. Influence of drip irrigation and fumigation of Redglobe peach yield. (Abstr.) HortScience 16:282. 'Redglobe' peaches were planted in 1975 in a split-split plot design with and without DBCP fumigant and with (1) no irrigation, (2) irrigation preharvest, (3) irrigation postharvest, (4) irrigation all season, and (5) irrigation all season plus split applications of N. Irrigation increased yields in 1977-79. Fumigation significantly increased yields only in 1978. The interaction was significant in 1978, 1980, and for total yields 1977-80.
  160. Horton, Billy D.; Edwards, J. H.; Wehunt, E. J.; Chessness, Jerry; and Bruce, R. R. 1978. Effects of drip irrigation and soil fumigation on yields and growth of 'Redglobe' peaches. Proc. Annu. Conv. Natl. Peach Counc., 37th, pp. 25-28. A soil-moisture management study was conducted with the irrigation

- treatments, (1) none, (2) before harvest, (3) after harvest, and (4) all season. Half the plots were treated with DBCP to determine the effects on peach tree short life. Data from 1976-77 are presented in this paper. Treatments with DBCP increased growth significantly in all plots. The irrigation treatments before harvest and all season also significantly increased the yield of peaches.
161. Horton, Billy D., and Prince, Victor E. 1970. Time of pruning peach trees affects short life. (Abstr.) HortScience 5:349. An abstract that cites pruning in November and December as increasing tree death from short life over pruning in January and February.
  162. Horton, Billy D.; Prince, V. E.; and Wehunt, E. J. 1974. Stem pitting of peach in Georgia. Plant Dis. Rep. 58:553. Stem-pitting disease of peaches has been reported in 15 States, but the disease was unreported in Georgia until it was seen in July 1973 in a 2-year old commercial orchard in Washington County, Ga. The symptoms were typical for the disease and randomly scattered in the field, which suggested the disease originated in the Tennessee nursery where the trees were purchased. This is strengthened by the fact that replants showed no symptoms.
  163. Horton, Billy D.; Wehunt, E. J.; Edwards, J. H.; Bruce, R. R.; and Chessness, J. 1979. Interaction of drip irrigation and soil fumigation (DBCP) on 'Redglobe' peach yields. (Abstr.) HortScience 14:464. Data from an irrigation-DBCP experiment discussed in No. 162 are given for 1978. In this year the after harvest and all season irrigation with DBCP increased yield by 107-134 bu/acre. Irrigation all season without DBCP increased yield 56 bu/acre.
  164. Horton, Billy D.; Wehunt, E. J.; Edwards, J. H.; Bruce, R. R.; and Chessness, J. L. 1981. The effects of drip irrigation and soil fumigation on 'Redglobe' peach yields and growth. J. Am. Soc. Hortic. Sci. 106:438-443. 'Redglobe' peaches were grown under drip irrigation and no irrigation, with and without fumigation with DBCP. The irrigation treatments were (1) nonirrigated, (2) irrigated until harvest, (3) irrigated from harvest to dormancy, and (4) irrigated all season. Fumigation increased trunk cross-sectional area by 18 cm<sup>2</sup>, and when postharvest water was applied, the increase was 25 cm<sup>2</sup> at the end of 1978. Irrigation increased marketable yields of fresh peaches from 3.6 to 7.5 t/ha in 1977. In 1978, fumigation did not increase yields unless preharvest water was applied; then yields were increased from 12.1 to 17.2 t/ha. Fumigation apparently increased water use as indicated by the increased rate of controlled water application. Fumigation reduced populations of Macroposthonia xenoplax from a range of 30-400 to a range of 1-30 nematodes/150 cm<sup>3</sup> of soil.
  165. Hunter, J. H. 1968. Effect of winter temperatures on initiation of growth of Schley and Stuart pecans. Proc. Southeast. Pecan Grow. Assoc. 61:162-166. Evidence based on the time of appearance of spring buds, the pistillate flowers, and catkin bloom is presented that indicates the 'Stuart' variety requires more chill hours than the 'Schley' variety.
  166. Hunter, J. H., and Hammer, Harold E. 1947. Results of applying different fertilizers to the Moore variety of pecan over a 10 year period. Proc. Southeast. Pecan Grow. Assoc. 40:10-32. Investigations conducted on various rates and types of fertilizers applied to pecans showed that similar yields may be obtained from fertilizers applied to pecan trees at any time during the growing season. However, applications during the active growing period may affect the quality of the nuts adversely in some years and thus should be avoided. As total yields of nuts per tree are increased by the use of fertilizers, the size of the individual nuts becomes smaller;



the extent of this effect is influenced by the adequacy of rainfall and its distribution. Pecan trees respond readily to applications of nitrogen fertilizers applied alone, but more slowly to the other elements contained in a mixed fertilizer. As a long-time practice, mixed fertilizers will increase yields and improve sufficiently to make their use more profitable than the use of fertilizers containing nitrogen alone. Pecan trees are slow to respond to increased amounts of plant nutrients offered them in fertilizer, but after long-continued practice, those receiving the higher quantities will produce higher yields. Dolomitic limestone used in the fertilizers to prevent them from increasing the acidity of the soil did not increase yields under the conditions of this test. At the end of the 10-year period, trees growing in soil with the greatest acidity (pH 4.9) were producing as well as those receiving limestone (soil pH 5.8).

167. Hunter, R. E., and McGlohon, N. E. 1977. Fungicide evaluation for pecan scab 1976. *Am. Phytopathol. Soc.* 32:67. All Difolatan and Du-Ter treatments gave commercial control of pecan scab on both 'Schley' and 'Stuart' varieties at full and abbreviated schedules except for Difolatan at the abbreviated schedule on both varieties, and Difolatan plus Benlate at the abbreviated schedule on the 'Schley' variety.
168. Hunter, R. E.; Newton, J. E.; and Kolb, M. C. 1978. Preliminary research on a fungicide spray schedule for pecan scab based on weather data. *Proc. Southeast. Pecan Grow. Assoc.* 71:171-177. In 1977, a mild scab year, six fungicide sprays of Du-Ter or Difolatan applied after 100-hour periods of leaf wetness resulted in no scab infection on nuts, but nine sprays of the same material applied on a conventional schedule resulted in 25 percent infected nuts on the 'Schley' cultivar.
169. Hunter, R. E., and Payne, J. A. 1980. Modified spray schedules for control of scab in Georgia and Texas. *Proc. Southeast. Pecan Grow. Assoc.* 73:61-66. Additional experiments are reported from Georgia and Texas that compare applications of Du-Ter based on the (1) regular recommended schedule, (2) tree growth, (3) leaf wetness, (4) symptoms increase, or (5) tree growth and leaf wetness. Control of scab at Byron on the 'Schley' trees was not statistically different from all spray schedules but was better than the check. On the 'Stuart' trees, the control of scab by all spray schedules was not statistically different except for the symptom increase schedule, which was significantly better than the check. At Brownwood, the control achieved by the tree growth plus leaf wetness schedule was not statistically different from the symptom increase schedule but was significantly better than either the tree growth or leaf wetness sprays, which in turn were better than the check. In addition to scab, the effectiveness of spray schedules was evaluated on other diseases present. Downy spot and vein spot were present on the 'Western' trees in Texas. However, none of the spray schedules gave significantly better control of these two diseases than the check. In Georgia, the regular, tree growth, leaf wetness, and tree growth plus leaf wetness schedules gave equally good control of downy spot on 'Stuart' trees and significantly better control than the check which in turn was significantly better than the symptom increase schedule.
170. Hunter, R. E., and Roberts, D. D. 1977. Problems and approaches related to screening for scab resistance in pecans. *Proc. Southeast. Pecan Grow. Assoc.* 70:69-75. The USDA program to develop scab-resistant cultivars is discussed. The use of scab-resistant cultivars as parents is suggested with evaluations in both Byron, Ga. and Brownwood, Tex.

171. Hunter, R. E., and Roberts, D. D. 1977. Problems and approaches related to screening for scab resistance in pecans. *Pecan South* 4:124-147. These data are also presented in No. 170.
  172. Hunter, R. W., and Roberts, D. D. 1978. A disease grading system for pecan scab. *Pecan Q.* 12:3-6. A scab grading system that ranks leaflets and nuts according to susceptibility to the disease is given as follows: (1) immune, (2) resistant, (3) questionable resistance, (4) susceptible, and (5) very susceptible. Color photographs of each grading unit are given.
  173. Hutchins, Lee M.; Cochran, L. C.; Turner, W. F.; and Weinberger, J. H. 1953. Transmission of phony disease virus from tops of certain affected peach and plum trees. *Phytopathology* 43:691-696. Contrary to previous results, transmission of phony peach with scions was demonstrated, and it was proved that the virus could exist in the tops of affected trees. Transmission from certain affected trees and from certain arms on affected trees but not from others also proved that the causal virus was not uniformly distributed in the tops. Scions taken from trees grown from virus-bearing scions gave consistent transmission, indicating that when the virus invades the growing point, it becomes more uniformly distributed in subsequent tissue and once in the tissue, some of it remains there. Preliminary results indicated that the virus moved into tops or moved very slowly into tops of peach trees inoculated in the roots.
- J
174. Jacklin, S. W.; Richardson, E. G.; and Yonce, C. E. 1970. Substerilizing doses of gamma irradiation to produce population suppression in plum curculio. *J. Econ. Entomol.* 63:1053-1057. When plum curculio adults were irradiated with  $CO^{60}$ , longevity was reduced greatly when the dose was 8 krad, the amount necessary for complete sterilization of both sexes. However, substerile dosages (6 krad), when used with high overflooding ratios, reduced fertility of beetles in the laboratory by 90 percent.
  175. Jacklin, S. W., and Yonce, C. E. 1968. Late summer injury to peach tree buds caused by the shot-hole borer. *J. Econ. Entomol.* 61:882-884. Damage by shothole borers consists of punctures made in or around the bud. Leaves that had not abscised became stuck in the copious flow of gum that issued from the punctures. The source of the infestation was a pile of dead trees bulldozed after harvest and infestations were shown to be related to distance from the pile. In dispersing, the shothole borer apparently stops and feeds at the nearest trees.
  176. Jacklin, S. W., and Yonce, C. E. 1969. Induced shift of the diurnal emergence and calling of the peachtree borer. *J. Econ. Entomol.* 62:21-22. Peachtree borer moths were induced to emerge in synchronization with light cycles occurring both earlier and later than the solar day. Also, the time of the first call by female moths was similarly shifted. Moreover, moth calls on the subsequent days of adult life were rescheduled to synchronize with a different light cycle than the one that prevailed when they emerged and made their first call.
  177. Jacklin, S. W., and Yonce, C. E. 1970. Emergence, longevity and fecundity of adult plum curculio reared from two sizes of larvae at two temperatures in soil with a range of moisture. *J. Econ. Entomol.* 63:673-674. Survival to adulthood is shown to be reduced by smaller larval size; a greater sensitivity to soil moisture is also demonstrated. Adult fecundity is greatest for adults emerging from larger larvae.
  178. Jacklin, S. W.; Yonce, C. E.; and Hollon, J. P. 1967. The attractiveness of female to male peachtree borers. *J. Econ. Entomol.* 60:1291-1293. Caged virgin females first



began calling at 12:05 p.m. on their first day of life. On subsequent days, they began calling at a mean time of 11:13 a.m. The activity of responding with males was greatest between 11:00 a.m. to 1:00 p.m. Calling females were most attractive to males on the second and third days of adulthood.

179. Jacklin, S. W.; Yonce, C. E.; and Hollon, J. P. 1968. Crowding effects on plum curculios reared at several densities on two sizes of green apple. J. Econ. Entomol. 61:816-819. Several densities of newly emerged curculios were caged on thinning apples, and results were obtained that showed the number of eggs per female, larval emergence, and larval size were all adversely affected by the higher density.
180. Jackson, P. R., and Payne, J. A. 1980. Comparison of pesticides for pecan leaf scorch mite control. Pecan South 7:26-27. Four pesticides were evaluated as controls for the pecan leaf scorch mite (PLSM). Kelthane was found to be the most effective in reducing PLSM populations with 99.1 percent control. It was followed in effectiveness by Zolone with 97.7 percent control and Mesurol with 96.4 percent control. Du-Ter did not appear to be effective in controlling PLSM, the population almost doubling between sampling periods. However, it does appear that a continuous application of Du-Ter will help to suppress PLSM levels since the Du-Ter plot receiving continuous or repeated applications had fewer mites per compound leaf.

## K

181. Kaloostian, George H. 1961. Evaluation of adhesives for sticky board traps. J. Econ. Entomol. 54:1009-1011. Yellow, 5- by 10-inch sticky-board traps were exposed in a peach orchard from Aug. 29 to Sept. 28, 1960, to compare Deadline, Stickem, and Tanglefoot as coating materials. Boards coated with Deadline and

Stickem captured 10 times as many Homoptera and Diptera as those coated with Tanglefoot.

182. Kaloostian, George H., and Pollard, Herschel. 1962. Experimental control of phony peach virus vectors with Di-Syston. J. Econ. Entomol. 55: 566-567. Experiments were conducted to determine the effectiveness of the systemic insecticide, Di-Syston against the phony disease vector leafhoppers, Cuerna costalis and Homalodisca coagulata. Dosages of 100 g or more per tree gave 100 percent control of the leafhoppers.
183. Kaloostian, G. H.; Pollard, H. N.; and Turner, W. F. 1962. Leafhopper vectors of Pierce's disease virus in Georgia. Plant Dis. Rep. 46:292. Three leafhoppers, Homalodisca coagulata (Say), Oncometopia undata (F.), and Cuerna costalis (F.) are reported as vectors of Pierce's disease virus of bunch grapes in Georgia.
184. Kays, S. J.; McCarter, S. M.; Mathur, D. D.; and Payne, J. A. 1978. Controlled atmosphere storage of Chinese chestnuts, Castanea mollissima Bl. (Abstr.) HortScience 13:71. Principal organisms associated with postharvest storage losses were Diplodia sp., Phoma sp., Gloeosporium sp., and Fusarium moniliforme. Storage of mature nuts in a gas atmosphere of 2.5 percent oxygen gave superior results in comparison to higher oxygen levels and less mature nuts.
185. KenKnight, Glenn. 1957. Translocation of phony peach virus. (Abstr.) Phytopathology 47:20. It was demonstrated experimentally that phony peach virus in peach stems traveled toward roots more slowly than upward.
186. KenKnight, Glenn. 1957. Translocation of peach rosette virus. (Abstr.) Phytopathology 47:20. Peach rosette virus was inoculated into 2-year-old peach trees in April; the virus moved more rapidly toward the roots than upward and did not pass a point where bark rings were removed.

187. KenKnight, Glenn. 1958. Thermal stability of peach rosette virus. *Phytopathology* 48:331-335. Stems or entire trees of peach and plum inoculated with peach rosette virus were given hot-water-bath treatments. Peach rosette virus transmission did not result with bark patches from stems treated longer than 18 min at 50° C. In an experiment employing entire trees, the thermal death times of the virus appeared to be less than 90 min at 45° C, about 18 min at 50° C, and about 2 min at 55° C. However, grafting nurse trees to rosetted trees showed the thermal death time of the virus to be over 60 min at 50° C and 10 min at 56° C.
188. KenKnight, Glenn. 1961. Spread of phony disease into Georgia peach orchards. *Phytopathology* 51:345-349. Locations of phony-diseased trees were charted in young peach orchards in Peach County, Ga. Spread into an orchard from a source at orchard edge appeared to follow this pattern: The number of diseased trees in the first row equals the number in the next two rows, in the next four rows, and so on in a geometric regression. Obstructions in the path of spread appeared to protect orchards to the leeward and to cause "compression of regression" in orchards to the windward. Groups of diseased trees apparently resulting from obstructions in the path of spread were regarded as analogous to sand dunes. The volume of spread from a potential source of the virus appeared to be correlated with prevailing wind direction.
189. KenKnight, Glenn. 1961. Epidemiology of peach rosette virus in Prunus angustifolia. *Plant Dis. Rep.* 45:304-305. Large numbers of chickasaw plum trees, Prunus angustifolia, were killed in Peach County, Ga. when peach rosette virus was experimentally introduced into thickets of that plum. Tests indicated that the virus spread through underground stolon roots and spread from top to top through the agency of an unknown vector.
190. KenKnight, Glenn; Bruer, H. L.; and Shepard, C. E. 1951. Occurrence of phony disease in wild plum thickets distant from peach orchards in Spartanburg Co., S.C. *Plant Dis. Rep.* 35:183-185. Experiments are reported from South Carolina in which root sections from wild plums located several miles from the nearest peach orchard were grafted onto peach seedlings. Eight of 67 trees developed phony disease which indicates that the disease is endemic in wild plums in South Carolina.
191. KenKnight, Glenn; Cole, J. R.; McGlohon, Norman E. 1970. Bunch disease of pecan found in Georgia. *Plant Dis. Rep.* 54:12. Bunch disease of pecan has been found in Mitchell County, Ga. It was recently observed in a 55-acre grove southwest of Camilla, Ga. Bunch occurs mainly on bottom lands and along streams in Mississippi, Louisiana, Arkansas, Texas, Oklahoma, Missouri and Kansas. It has never been reported east of Meridian, Miss., until its recent discovery in Georgia. The Mitchell County grove has about 100 infected trees--mostly 'Schleys' and seedlings. The degree of infection varies from small on some trees to 100 percent on others. The grower has noted a rapid increase in the number of diseased trees within the last 2 or 3 years.
192. Kirkpatrick, H. C.; Lowe, S. K.; and Nyland, G. 1975. Peach rosette: the morphology of an associated mycoplasma-like organism and the chemotherapy of the disease. *Phytopathology* 65:864-870. Prunus tomentosa was the only cherry host susceptible to peach rosette. The almond, P. dulcis, cultivar 'Jordanolo' was not superior to peach, P. persica, in symptom expression or duration of incubation period. Nevertheless, 'Jordanolo' did persist more vigorously as an indicator plant and appeared to be more resistant to the lethal effect of rosette after dormancy. Mycoplasma-like organisms (MLO's) were found in the sieve elements of



rosette-infected leaves of Vinca rosea, P. persica, and P. dulcis, but not in healthy leaves of those hosts. The partial remission (37.5 percent) of rosette symptoms occurred after treatment with tetracycline hydrochloride and the lesser remission (9.1 percent) with chlorotetracycline hydrochloride and oxytetracycline dihydrate, support the belief that the MLO is the causal agent of peach rosette.

193. Kirkpatrick, H. C.; Thompson, J. M.; Edwards, J. H. 1975. Effects of aluminum concentration on growth and chemical composition of peach seedlings. HortScience 10:132-134. Aluminum concentrations of 0, 3, 10, 30, and 100 ppm in nutrient solutions reduced proportionately the dry weight of stems, roots and leaves of seedling peaches. Roots grown at 30 and 100 ppm Al were shorter, thicker, and had fewer branches than roots grown at lower concentrations. The concentrations of Ca, Mg, Mn, and P were reduced as Al concentrations increased.

L

194. Large, John R. 1953. Progress report on pecan scab control with high pressure ground spray machine in Florida in 1952. Proc. Southeast Pecan Grow. Assoc. 46:76-88. Pecan scab was not serious in north Florida in 1952. All of the proven fungicides provided excellent scab control on 'Money-maker', 'Moore', and 'Mahan' varieties. Approximately equal scab control was obtained with four, five, or six summer applications. Insects were satisfactorily controlled by using parathion and malathion.
195. Large, John R. 1953. Aeroplane spraying to control pecan scab in 1952. Proc. Southeast. Pecan Grow. Assoc. 46:71-75. With airplane spraying, the upper part of the trees showed much better scab control than the lower portion. This is just the opposite of the usual results where trees have been sprayed from the ground. Many limbs in the top of the trees broke off

because of the growth and weight of the nuts, but many of the nuts on the lower branches were severely scabbed. Three applications of parathion resulted in satisfactory commercial control of the pecan insects.

196. Large, John R.. 1954. Summary of 2 years aeroplane spraying experiments to control pecan scab. Proc. Southeast. Pecan Grow. Assoc. 47: 55-64. The upper part of the trees sprayed from an airplane showed much better scab control than the lower portion. The application of 25 percent parathion emulsion or 50 percent malathion emulsion did not give commercial control of nut casebearer. Airplane and ground sprays of parathion and malathion resulted in commercial control of fall webworm and black aphids.
197. Large, John R. 1954. Progress report on experiments to control pecan scab with high pressure ground spray machine in Florida in 1953. Proc. Southeast. Pecan Grow. Assoc. 47:67-82. Despite heavy pecan scab presence in 1953, very good control was obtained in the experimental plots at Monticello and Quincy, Fla. with a spray schedule consisting of five applications of: (1) Zineb 2-100 plus 1 qt of summer oil; (2) 4-1-100 bordeaux mixture followed by four applications of 6-2-100 bordeaux mixture; or (3) a split schedule using bordeaux in applications of 1 and 2, ziram 2-100 plus 1 qt summer oil in applications 3, 4, and 5.
198. Large, John R. 1956. Aeroplane spraying to control pecan scab in 1955. Proc. Southeast. Pecan Grow. Assoc. 49:12-16. Spraying 'Money-maker' pecan trees five times from an airplane with 18X normal Glyodin plus lime with parathion added in the May, July, and August application increased the value of the nuts at least 20 percent. Ten trees sprayed five times produced 1,047 lb of nuts. Ten trees sprayed on Aug. 11 produced 863 lb of nuts. The quality of the nuts from the trees sprayed five times was much better than that of the others. Two

- 'Mahan' trees in the plot sprayed five times from an airplane produced 150 lb of nuts, and a good crop was harvested from one 'Schley' tree.
199. Large, John R. 1956. Pecan scab control in Florida with a small four gallon per minute tractor power take-off spray machine in 1955. Proc. Southeast. Pecan Grow. Assoc. 49:17-20. In 1955, a small tractor power take-off sprayer operating at 300 lb pressure and delivering four gal of spray per minute was as effective in controlling pecan scab as the standard hydraulic sprayer. In operating the small sprayer, more time was required to thoroughly cover each tree. There was more danger of overspraying than of not using enough spray.
  200. Large, John R. 1956. Embryo rot ("Ambrose Rot") of pecans. Proc. Southeast. Pecan Grow. Assoc. 49:21. Embryo rot is believed to be caused by the combination of a heavy set of nuts and a shortage of moisture in the spring and at the time of kernel development. Competition with other crops and rainfall in September, which caused a flush of growth after a long dry spell had matured the nut kernels, are also believed to be factors.
  201. Large, John R. 1958. Summary of nine years experiments on pecan scab control in Florida. Proc. Southeast. Pecan Grow. Assoc. 51:83-91. This paper summarizes the results of 9 years of experiments to control pecan scab in northern Florida. In total, regular bordeaux mixture gave the best control.
  202. Large, John R. 1959. Results of 1958 fungicide tests on pecan scab on Mahan and Moore trees in North America. Proc. Southeast. Pecan Grow. Assoc. 52:71-75. Results of fungicide tests conducted in north Florida during 1958 to control pecan scab are reported. The best scab control was obtained with a dormant application of Puratized Agricultural Spray followed by six applications of bordeaux mixture, six applications of zineb plus oil, or the split bordeaux-ziram spray schedule. Burning the leaves under the trees, then spraying with regular bordeaux mixture seemed to reduce the scab infection 8 or 9 percent.
  203. Large, John R. 1960. Results of 1959 fungicide tests on pecan scab control on Moore and MoneyMaker trees in north Florida. Proc. Southeast. Pecan Grow. Assoc. 53:38-41. Results of fungicide tests conducted in Florida during 1959 to control pecan scab are reported. Bordeaux mixture gave the best control of all materials tested.
  204. Large, John R. 1961. Concentrated chemicals applied from a helicopter for control of pecan diseases. Proc. Southeast. Pecan Grow. Assoc. 54:95-103. Experiments conducted with helicopter and conventional spray applications for control of disease and insects of pecans were of sufficient value to justify more extensive experiments.
  205. Large, John R., and Cole, J. R. 1964. Karathane-controlled powdery mildew on the Curtis and Pabst varieties of pecan in Florida and Georgia. Phytopathology 54:1174. It was demonstrated in Georgia and Florida on the Pabst and Curtis varieties that three applications of dodine did not control mildew, whereas a dodine-Karathane spray combination controlled the powdery mildew and improved quality of pecan nuts.
  206. Littrell, R. H., and Hunter, R. E. 1979. Laboratory and field studies for the suppression of primary inoculum of the pecan scab fungus. Proc. Southeast. Pecan Grow. Assoc. 72:71-76. In this paper, Cyprax and Difolatan are evaluated in the laboratory and field for their effects on sporulation of stromata and viability of conidia. Cyprax was more effective in preventing sporulation on stromata than was Difolatan at all dosages tested. However, neither was sufficiently effective to be considered of economic value.
  207. Littrell, R. H.; Worley, R. E.; and Gentry, C. R. 1978. Low pressure



- trunk injection of pecan for prevention of premature defoliation. Proceedings of a Symposium on Systemic Chemical Treatments in Tree Culture (East Lansing, Mich.), pp. 267-274. Promising results are reported for the use of Bidrin for aphid control and benomyl for leaf scorch when applied by trunk injection. Premature defoliation of leaves by the fungus was prevented, and aphids were controlled for up to 111 days after injection of the chemicals.
208. Littrell, R. H.; Worley, R. E.; and Payne, J. A. 1974. Fungal leaf scorch of pecan. Proc. Southeast. Pecan Grow. Assoc. 67:143-146. Fungicide tests are reported from two Georgia locations, on 'Schley' and 'Stuart' cultivars. All fungicides tested, Benlate, Topsin M, Difolatan 4, and Du-Ter gave satisfactory control of fungal leaf spot in the Lee County tests. In Byron tests, under heavier disease pressure, fungal leaf spot was significantly reduced on 'Schley' variety by Benlate on 3 to 4 week intervals. On 'Stuarts', a less susceptible variety, all treatments reduced fungal leaf spot.
  209. Littrell, R. H.; Worley, R. E.; and Payne, J. A. 1974. Variety vs leaf scorch. Pecan South 1:19,24. This research suggests several facts concerning the development of fungal leaf scorch. Expression of symptoms normally occurs in August depending on weather conditions. Excessive rainfall and high temperatures are contributing factors to the onset of symptom development. Leaf scorch often goes unnoticed because many believe it is a normal process of senescence. However, research has demonstrated that when fungicides are used throughout the season, leaves do not drop naturally until the first killing frost. Results of mineral analysis suggested concentration of certain nutrients was correlated with fungal leaf spot.
  210. Littrell, R. H.; Worley, R. E.; and Payne, J. A. 1974. Influence of pecan cultivars and fungicides on control of fungal leaf scorch. Proc. Annu. Conf. Ga. Pecan Grow. Assoc., 9th, 5:53-55. These data were also published by the authors in No. 209.
  211. Littrell, R. H.; Worley, R. E.; and Payne, J. A. 1974. Fungal leaf scorch on pecan. Proc. Annu. Conf. Ga. Pecan Grow. Assoc., 9th, 5:56-59. These data are also presented by the authors in No. 209.
  212. Lutz, Harry. 1938. The effect of size of young pecan trees on their subsequent growth and yield. Proc. Am. Soc. Hortic. Sci. 36:335-338. This paper shows a closer relationship between initial size and yield of a pecan tree than between initial size and growth. The relationship between initial size and yield is so close that it makes possible the planning of experiments where trees of uniform size cannot be obtained.
  213. Lutz, Harry, and Hardy, M. B. 1939. The effect of foliar conditions on the photosynthetic activity of pecan leaves. Proc. Am. Soc. Hortic. Sci. 37:484-488. The results of this study show that photosynthetic activity of leaves increases to a small extent with increased vigor as indicated by leaf color. Foliage diseases, besides defoliating the trees, decrease the photosynthetic activity by at least one-third. The fact that healthy foliage continues to function until it drops makes it of paramount importance that measures be taken to retain the foliage on a tree as long as possible.
- M
214. Madden, George D.; Brown, Ellis J.; and Malstrom, Howard L. 1976. 'Kiowa' Pecan. HortScience 11:522. 'Kiowa' pecan is a precocious and prolific bearer whose nuts resemble those of 'Desirable' in size and shape but have a thinner shell. 'Kiowa' is a selection from a 'Mahan' by 'Odom' cross made by L. D. Romberg in 1953.

215. Malstrom, H. L. 1973. The USDA pecan research program at Byron, Georgia. Annu. Rep. North. Nut Grow. Assoc. 64:18-21. This paper provides an overall review of the USDA pecan research progress at Brownwood, Tex. and Byron and Athens, Ga.
216. Malstrom, H. L. 1974. The relationship of stored reserves to yield in mature pecan trees. Proc. Western Pecan Conf., 8th, pp. 65-70. Data presented in this paper show that the size of mature pecan trees has a considerable effect on their bearing potential from year to year. Also, the level of starch in roots between November and March is governed, at least in part, by the preceding year's crop. The fact that the sugar level in roots does not vary with yield is perhaps due to a conversion of starch to sugar as the available sugar is used for respiration and root growth during winter. Low correlations of sugar and starch in 1-year-old twigs with yield may indicate that this part of the aboveground tree received adequate stored reserves even under heavy crop load.
217. Malstrom, H. L. 1976. An evaluation of 10 varieties in Georgia. Proc. Southeast. Pecan Grow. Assoc. 7:40-52. Ten prominent varieties are evaluated from a variety and selection collection at Albany, Ga. The trees ranged from 7 to 10 years old, were irrigated for the past 5 years, fertilized liberally, and continuously sprayed for disease and insect control. Tested varieties were 'Sioux', 'Cherokee', 'Mohawk', 'Chickasaw', 'Shawnee', 'Wichita', 'Desirable', 'GraBohls', 'Kiowa', and 'Cheyenne'. The article should be consulted for specific data on performances of the tested varieties.
218. Malstrom, H. L., and Madden, G. 1975. Study compares trees of Southeast. The Pecan Q. 9:16-17. Variety evaluations conducted at Albany, Ga. indicate 'Cherokee', 'Chickasaw', 'GraBohls', 'Wichita', 53-9-1, and 53-9-191 should be classified as promising varieties for high density trial planting. Of these, 'Chickasaw' appears to be relatively scab resistant. 'Wichita' suffers from late season nut splitting, which can reduce the crop by as much as 20 percent. Most of these varieties are vigorous, and when grown under irrigated conditions, would have to be spaced more widely than when grown under dryland conditions. Varieties that show promise at wider spacing are 'Desirable', 'Mohawk', 'Shawnee', and 'Sioux'. All of these will scab under some conditions. 'Mohawk' produces the largest nuts, but they have a woody texture, while the nut quality of the other three is good.
219. Malstrom, H. L., and Madden, G. D. 1976. Training young pecan trees. Pecan Q. 10:12-17. This is a popular article that discusses the establishment and training of trees within a new orchard. Several ways are suggested to begin a new orchard: (1) plant seed, (2) transplant ungrafted trees, or (3) transplant grafted trees of the desired variety directly in place. Once the trees are planted, a lengthy process of permanent training must begin.
220. Malstrom, H. L., and McMeans, Jack L. 1976. Yield and nut quality of several varieties and selections in the Southeast. Pecan South 3:486-490. Based on data from the past few years, 'Barton'; 'Sioux'; 'Shawnee'; 'Desirable'; and 'Kiowa'; and selections 55-12-8, 55-12-17, and 53-11-139 should be planted from 40 to 50 ft apart if they are not to be pruned or otherwise manipulated. Based on yield and nut quality, of those adapted to wider spacing, 'Sioux', 'Shawnee', 'Kiowa', and 53-11-139 seem to have the most potential. 'Cheyenne'; 'Chickasaw'; 'GraBohls'; 'Shoshoni'; and perhaps 'Cherokee'; 'Mohawk'; and selections 42-23-x, 45-10-38, 48-13-311, and 53-9-1 appear best adapted to true high-density spacing.
221. Malstrom, H. L., and McMeans, J. L. 1977. A chemical method of pruning young pecan trees. HortScience



- 12:68-69. Dikegulac applied at 0.25 and 0.5 percent 6 weeks before leaf fall delayed bud break and promoted lateral shoot development on twigs of 5-year-old pecan trees the following spring. Foliar applications made 3 weeks after bud break retarded shoot growth and damaged leaflets while increasing lateral shoot development. Mechanical pruning of untreated trees did not induce lateral branching.
222. Malstrom, H. L., and McMeans, J. L. 1977. Growth and yield patterns of pecan varieties in the Southeast. *Pecan South* 4:270-274. Precocity, prolificacy, and growth habit all have to be considered in determining adaptability to high-density planting. 'Chickasaw'; 'Wichita'; 'GraBohls'; and perhaps 'Shoshoni', 'Western', and 'Cheyenne' can be planted as close as 30 ft apart. 'Mohawk', 'Caddo', and 'Kiowa' should be spaced no less than 40 ft apart. Diameter of tree limb spread appears to be a better measure of crowding than total area of the trunk cross section per acre.
  223. Malstrom, H. L., and McMeans, J. L. 1977. Chemical pruning of young pecan trees. *Proc. Western Pecan Conf.*, 11th, pp. 20-25. This paper is adapted from the paper published earlier by the same authors in Nos. 221 and 224.
  224. Malstrom, H. L., and McMeans, J. L. 1978. Chemical pruning of young pecan trees. *Pecan Q.* 14:23-28. This article is adapted from the paper published earlier by the same authors in No. 221.
  225. Malstrom, H. L.; McMeans, Jack; and Madden, George D. 1977. Pecan variety performance in the Southeast. *Pecan Q.* 11:26-32. The performance of various varieties in the Southeast produced under irrigation and intensive management is given. Production, disease, insect resistance, and nut quality are cited as the important factors in variety selection.
  226. Malstrom, H. L., and Sparks, D. 1973. Analysis of yield components in mature trees of 'Schley' pecan, *Carya illinoensis* Koch. *J. Am. Soc. Hortic. Sci.* 98:496-500. All yield components individually correlated with yield. However, percentage of shoots fruiting, shoot-fruiting intensity, and tree-fruiting intensity were not independent variables; and, in multiple regression analysis, yield correlated only with percentage of shoots fruiting and tree size. The multiple relationship gave a poor estimate of yield since (1) percentage of shoots fruiting and their relationship to yield varied with the portion of the tree canopy samples and (2) the relation of yield to tree size was apparently obscured by irregular bearing among individual trees. As indicators of fruitfulness, tree-fruiting intensity and percentage of shoots fruiting were essentially equal. Yield variation was governed more by percentage of shoots fruiting than by shoot fruiting intensity. Nut weight varied curvilinearly with yield and nuts per tree.
  227. McCarter, S. M.; Kays, S. J.; Payne, J. A.; and Shokes, F. M. 1979. Occurrence of microorganisms in Chinese chestnuts at harvest and during storage. (Abstr.) *Phytopathology* 69:S-39. These data are presented in detail by the authors in No. 228.
  228. McCarter, S. M.; Kays, S. J.; Payne, J. A.; and Shokes, F. M. 1980. Influence of oxygen concentration on Chinese chestnuts and their spoilage organisms. *Plant Dis.* 64:471-475. The stage of maturity of chestnuts when harvested and the oxygen level during storage significantly influenced the amount of deterioration that occurred particularly as the storage period increased. Mature nuts stored at low oxygen levels resulted in the most marketable nuts. Members of the genera Phoma, Fusarium, Paecilomyces, Candida, Diplodia, Penicillium, Pestalotia, Phomopsis, Alternaria, Aspergillus, Gloeosporium, Trichoderma, Rhizopus, Curvularia, Gliocladium, and Trichothecium and bacteria (mainly Bacillus spp.) were isolated from chestnuts at



- harvest or during storage. Aspergillus spp. were isolated infrequently, but some isolates produced appreciable amounts of aflatoxin.
229. McGlohon, N. E.; Payne, J. A.; and Wells, J. M. 1976. Pecan disease control results for 1975. Pecan South 3:310-312. Pecan scab and leaf scorch are reported as the most prevalent diseases in Georgia during 1975. The year was particularly bad for scab with fungicides about 20 percent less effective than usual. Pecan scab reduced the total Georgia yield by 10-15 million pounds. Pecan scab was barely controlled on the susceptible varieties such as 'Schley'. Tests are reported that determined Du-Ter and Benlate compatible when used on a tank mixture or when Benlate is followed by Du-Ter on the same tree. Difolatan is reported as an effective scab control in normal years, although in 1975 it did not give adequate control on 'Schleys'. However, Difolatan gives the best control of scorch followed by Benlate and then Du-Ter.
  230. McLaughlin, John R.; Doolittle, R. E.; Gentry, C. R.; Mitchell, E. R.; and Tumlinson, J. H. 1976. Response to pheromone traps and disruption of pheromone communication in the lesser peachtree borer and the peachtree borer (Lepidoptera: Sesiidae). J. Chem. Ecol. 2:73-81. The sex pheromone communication of the lesser peachtree borer and the peachtree borer were disrupted by permeation of the atmosphere with their respective sex pheromones, (E,Z)- and (Z,Z)-3,13-octadecadien-1-ol acetate. The two isomers seemed equally effective against both species. Disruption was greatest when the pheromone was evaporated from the tops of the peach trees; also, pheromone traps placed in the tree tops captured significantly more males than did traps placed lower in the trees. Neither the color nor the directional placement in a tree of pheromone-baited traps influenced captures of male lesser peachtree borers.
  231. McMurran, S. M., and Demaree, J. B. 1920. Diseases of southern pecans. U.S. Dep. Agric. Farmers' Bull. 1129, 22 pp. This bulletin is an excellent early account of the disease situation in pecan during the early 20th century.
  232. McMurran, S. M., and Demaree, J. B. 1924. Diseases of southern pecans. U.S. Dep. Agric. Farmers' Bull. 1129 (rev.). This is a revision of No. 231, 18 pp.
  233. McMurran, S. M., and Demaree, J. B. 1928. Diseases of southern pecans. U.S. Dep. Agric. Farmers' Bull. 1129 (rev.). This is a second revision of No. 231, 18 pp..
  234. Monroe, Gordon E. 1980. Shake-catch harvesting of pecans. Proc. Southeast. Pecan Grow. Assoc. 73:85-90. Over 12,000 lb of pecans were once-over shake-catch harvested from 370 trees that were 11 to 12 years old. Potential crop recovery ranged from about 93 percent for the western 'Schley' variety to about 97 percent for 'Desirable' and 'Wichita' varieties. Actual recovery for the three varieties averaged 5.6 percent less because some nuts were not caught by the collecting surfaces and conveyed into the containers. Averages of 1 percent on the ground before harvesting and 3 percent on the trees after harvesting accounted for the remainder of the total crops. The average potential recovery of 96 percent compared favorably with most ground-pickup harvesting systems. Favorable harvesting conditions existed over a period of at least 2 weeks with the 'Desirable' and 'Wichita' varieties.
  235. Monroe, Gordon E.. 1981. Over-the-row continuous tree-crop harvester: the basic equipment. ASAE Pap. 81-1062, 8 pp. An over-the-row machine with basic equipment for the continuous-travel harvesting and thinning of tree crops in orchards with 500 to 1,000 trees/ha is described.
  236. Monroe, Gordon E., and Peterson, D. L. 1977. Oversize mower cutterbar for pruning trees. Trans. ASAE

- 20:606-609. An over-sized cutterbar for pruning peaches is described. It cuts as well as multiple circular saw blades and has a much lower sound reading.
237. Monroe, Gordon E., and Peterson, D. L. 1978. New harvesting, thinning and pruning equipment for peaches. Proc. Natl. Peach Counc., 37th, pp. 39-40. A discussion of agricultural engineering progress at Byron on the development of a continuous shaking and harvesting machine, a mechanical thinning method and an oversize cutterbar for pruning are discussed in detail.
  238. Monroe, Gordon L., and Smith, M. R. 1979. Components for harvesting pineapple stumps--a progress report. Trans. ASAE 22:1245-1249, 1255. Component parts were developed that can be incorporated into harvesting equipment, these weigh and cost less than existing equipment and improve recovery of pineapple stumps by four times.
  239. Moznette, G. F. 1927. Pecan leaf case-bearer. Proc. Ga.-Fla. Pecan Grow. Assoc., 21st, pp. 39-42. Experiments were conducted that compared lead arsenate applied to pecan trees as spray and dusts for control of the pecan leaf case-bearer. Sprays gave superior control to the point that two applications with dust were required to equal one with spray.
  240. Moznette, G. F. 1929. Preliminary report on control of the black pecan aphid a comparatively new destructive insect of the pecan. Proc. Natl. Pecan Assoc., 28th, 3:192-196. The black pecan aphid seems to prefer the budded varieties, and of these, the 'Schley', 'Alley', and 'Stuart' are the most preferred. Such varieties as the 'Curtis', 'Moneymaker', and 'Moore' have not been observed to be attacked to any extent. Damage consists of a yellow area produced at the point of feeding. This yellow area increases in size as the insect continues to feed, and as the yellow area ceases to extend, it gradually turns brown, commencing at the point where the aphid started to feed. The black pecan aphid prefers the hardened area of the pecan foliage. In the initial part of the season it is found in the center part of the tree. It overwinters as eggs on the tree. Nicotine sulfate is the most effective control.
  241. Moznette, G. F. 1930. How some factors limit efforts for artificial control of the pecan nut case-bearer in the Southeast. Proc. Natl. Pecan Assoc., 29th, 4:40-45. The pecan nut casebearer is cited as an important pest of pecans in most pecan producing areas. The difficulty of chemical control because of oviposition site, larval feeding habits, and protection given by the hibemacum is discussed in detail.
  242. Moznette, G. F. 1933. The black pecan aphid and summary of progress toward effective and practical control. Proc. Ga.-Fla. Pecan Grow. Assoc., 27th, pp. 45-49. This paper contains data similar to that published by the author in No. 240.
  243. Moznette, G. F. 1934. Experiments in control of the pecan black aphid under orchard conditions. Proc. Southeast. Pecan Grow. Assoc. 28:55-61. The spraying of pecan trees with bordeaux mixture for control of pecan scab and leaf diseases seems to cause an increase in aphid infestation. During the seasons of 1932 and 1933, the pecan black aphid was controlled effectively and premature defoliation prevented by adding nicotine sulfate to applications of bordeaux mixture. In 1932, the trees set a better crop of nuts than the unsprayed trees, which were severely damaged by the pecan black aphid.
  244. Moznette, G. F. 1935. Recent experiments in the control of the pecan nut case-bearer in the Southeast. Proc. Southeast. Pecan Grow. Assoc. 29:37-40. Experiments conducted in the Southeast during 1932, 1933, and 1934 indicated that the pecan nut casebearer can be controlled effectively by nicotine with oil emulsion and by nicotine with fish oil. One application of nicotine-oil gave control nearly as



- good as two applications. Summer oil-emulsion used alone did not give effective results. Grading data at harvest indicated that more than one application of nicotine-oil spray may not be advisable, because two applications reduced nut size.
245. Moznette, G. F. 1938. Some important biological factors in the control of the hickory shuckworm on pecan. Proc. Southeast. Pecan Grow. Assoc. 32:11-14. This paper is a review of the various aspects of the hickory shuckworm's biology and life cycle. The overwintering, spring emergence, effects of plowing on survival, damage, number of generations, and control are discussed.
246. Moznette, G. F. 1941. Progress in the control of hickory shuckworm on the pecan. Proc. Southeast. Pecan Grow. Assoc. 35:42-48. This paper is a review of the various aspects of the hickory shuckworm's biology and life cycle. The overwintering, spring emergence, effects of plowing on survival, damage, number of generations, and control are discussed.
247. Moznette, G. F. 1947. DDT for control of the pecan weevil. Proc. Southeast. Pecan Grow. Assoc. 40:49-53. Test results with DDT showed that at least two applications are necessary for effective control of the pecan weevil.
248. Moznette, G. F. 1948. The pecan weevil and latest developments in control. Proc. Southeast. Pecan Grow. Assoc. 41:79-82. A brief description of the pecan weevil's biology is given followed by data on its control with DDT and chlorinated camphene. DDT gave excellent control while that obtained with chlorinated camphene was less satisfactory.
249. Moznette, G. F.; Bissell, T. L.; and Adair, H. S. 1931. Insects of the pecan and how to combat them. U.S. Dep. Agric. Farmers' Bull. 1654, 59 pp. This bulletin was prepared to furnish pecan growers with complete information on the insects attacking pecans. The bulletin is excellent for the
- person wishing an overview of the insect problems before 1931.
250. Moznette, G. F.; Nickels, C. B.; Pierce, W. C.; Bissell, T. L.; Demaree, J. B.; Cole, J. R.; Parson, H. E.; and Lane, J. R. 1940. Insects and diseases of the pecan and their control. U.S. Dep. Agric. Farmers' Bull. 1829, 70 pp. This bulletin was prepared to furnish pecan growers with complete information on the diseases and insects attacking pecans. The bulletin is excellent for the person wishing an overview of the disease and insect problems before 1940.
- N
251. Nielsen, D. G.; Purrington, F. F.; Tumlinson, J. H.; Doolittle, R. E.; and Yonce, C. E. 1975. Response of male clearwing moths to caged virgin females, female extracts, and synthetic sex attractants. Environ. Entomol. 4:451-454. The pheromone (Z,Z)-3,13-octadecadien-1-ol acetate attracted significant numbers of four Sesiid species while a mixture of three isomers of this compound attracted large numbers of peachtree borers. The pheromone (E,Z)-3,13-octadecadien-1-ol acetate attracted only lesser peachtree borers.
- O
252. Okie, W. R., and Reilly, C. C. 1981. Reaction of peach and nectarine cultivars and selections to fungal gummosis incited by Botryosphaeria dothidea. (Abstr.) Hort-Science 16:412. The collection of 277 peach and nectarine cultivars and selections at Byron was evaluated for potential sources of resistance to fungal gummosis incited by B. dothidea. Naturally infected trees were rated visually based on the presence of cankers and gum exudates on the trunks and limbs. Visual diagnosis was confirmed by taking bark samples from trees of 58 cultivars; the pathogen was isolated from 93 percent of



- these trees. Nearly all commercial cultivars and advanced selections appeared moderately susceptible, with only minor differences among them. Greater differences were seen in a collection of exotic cultivars and selections, with some lines highly susceptible and several lines nearly symptom-free.
253. Osburn, Max R. 1950. Experiments for control of the pecan weevil. Proc. Southeast. Pecan Grow. Assoc. 43:26-30. Two spray concentrations of parathion were compared with one concentration of toxaphene and with the standard DDT treatment as a control for the pecan weevil. All the treatments were very effective in controlling the weevil. Although the standard DDT treatment gave the best control, toxaphene was nearly as effective at one-half the concentration of DDT, and parathion was very nearly as good as toxaphene.
  254. Osburn, Max R. 1952. Experiments for pecan weevil control in 1951. Proc. Southeast. Pecan Grow. Assoc. 45:105-109. In 1951, DDT, toxaphene, EPN, and parathion were tested for control of the pecan weevil in Byron and Fort Valley, Ga. In one experiment, where the weevil infestation was not very heavy, the standard DDT treatment, 6 lb of 50-percent wettable DDT and 6 lb of 40-percent wettable toxaphene gave perfect control. Four lb of 40-percent wettable toxaphene, 2½ pints of emulsified toxaphene containing 8 lb/gal, and 2 lb of 27-percent wettable EPN were slightly less effective but satisfactory. In a second experiment, where weevil infestations were very heavy, control was not as good.
  255. Osburn, Max R. 1953. Experiments for control of the hickory shuckworm. Proc. Southeast. Pecan Grow. Assoc. 46:13-18. Treatments of the insecticide EPN were made at different time periods during the nut-growing season to determine the best schedule for control of the hickory shuckworm. An early season series, a late season series, and a fall series were tested. A comparison of the percentage of shucks infested shows that the three late applications were as effective as six applications (three early and three late) or nine applications made throughout the season and significantly more effective than the three early applications or the check.
  256. Osburn, Max R. 1954. EPN for control of the hickory shuckworm on pecan. J. Econ. Entomol. 47:931. EPN on three spray schedules was tested as a control for the hickory shuckworm. All 3 schedules significantly reduced the hickory shuckworm, but 2 lb of EPN delivered on Aug. 6 and 19 and Sept. 2 was the superior schedule.
  257. Osburn, Max R. 1958. Control of the hickory shuckworm on pecan in Georgia. Proc. Southeast. Pecan Grow. Assoc. 51:73-76. In 1956 experiments were conducted to compare EPN with some new insecticides that had not been tested for shuckworm control, and in 1957 EPN was compared with Guthion, a material that provided results comparable to EPN in 1956. When the results from both the 1956 and 1957 experiments are considered, three applications of either EPN or Guthion, applied at 2-week intervals following the beginning of shell-hardening, were the most effective in controlling the shuckworm. Ryania and Bayer L 13/59 were inferior to either EPN or Guthion in most respects.
  258. Osburn, Max R. 1962. Pecan insects and their control. Proc. Southeast. Pecan Grow. Assoc. 55:109-127. This paper includes a brief discussion of the most important insects and mites that attack pecan and also includes control measures in tabular form.
  259. Osburn, Max R.; Calcote, Vernon; and Tedders, Walker L., Jr. 1964. Low volume sprays for pecan weevil control. Proc. Southeast. Pecan Grow. Assoc. 57:59-60. Experiments comparing low volume and conventional applications of EPN for weevil control showed that the

- low-volume treatment as effective as the conventional treatment.
260. Osburn, Max R.; Phillips, A. M.; and Pierce, William C. 1954. Insects and diseases of the pecan and their control. U.S. Dep. Agric. Farmers' Bull. 1829, 56 pp. This bulletin contains no data but is a comprehensive writeup on the major and minor insect and disease problems of pecans. It covers the biology, ecology, behavior, epidemiology, damage, economic significance and controls available in 1954.
  261. Osburn, Max R.; Pierce, William C.; Phillips, A. M.; Cole, John R.; and Barnes, G. L. 1963. Controlling insects and diseases of the pecan. U.S. Dep. Agric. Agric. Handb. 240, 52 pp. This is an excellent general publication that includes the biology, ecology, epidemiology and control of the numerous insects and diseases attacking pecans. It is a replacement for No. 261.
  262. Osburn, Max R., and Tedders, W. L. 1961. Control of pecan leaf casebearer. Proc. Southeast. Pecan Grow. Assoc. 54:86-87. In tests to control the pecan leaf casebearer, EPN, dimethoate, Diazinon, and Bayer 29493 all significantly reduced the population. There were no significant differences among the treatments.
  263. Osburn, Max R., and Tedders, Walker L., Jr. 1966. Control of the hickory shuckworm and the pecan weevil. Proc. Southeast. Pecan Grow. Assoc. 59:96-100. In tests to control the hickory shuckworm, EPN spray provided satisfactory control and was superior to sprays of parathion or malathion. Malathion was an unsatisfactory control. EPN below the recommended rates did not control the shuckworm. Both Sevin and Du-Ter were effective in reducing the pecan weevil population.
  264. Osburn, Max R., and Tedders, Walker L., Jr. 1967. Evaluation of Du-Ter (Hydroxytriphenyltin) for control of pecan insects. Proc. Southeast. Pecan Grow. Assoc. 60:19-25. Du-Ter was evaluated as an insecticide and compared to the standard controls against the pecan nut casebearer, the hickory shuckworm, the black aphid, and a mite, Eotetranychus hicoriae. Results showed parathion and Du-Ter equally effective against the pecan nut casebearer. EPN gave excellent control of the shuckworm, but Du-Ter was ineffective. Azinphosmethyl gave excellent control of the black pecan aphid and E. hicoriae.
  265. Osburn, Max R., and Tedders, W. L., Jr. 1969. Insecticides for control of the hickory shuckworm on pecan. J. Ga. Entomol. Soc. 4:178-180. In tests to evaluate pesticides against the hickory shuckworm, Hercules 14503 was very effective and compared favorably with the standard azinphosmethyl. Phosalone and GS-13005 provided some control, but Bacillus thuringiensis was ineffective.
- P
266. Payne, J. A. 1976. Pecan insects. Pecan South 3:352-354. This paper is similar to No. 292. It is a popular article and does not contain new data.
  267. Payne, J. A. 1976. Handbook of North American nut trees. Pecan South 3:547. This is a review of the book, "Handbook of North American Nut Trees".
  268. Payne, J. A. 1977. Leafminers of Chinese chestnut. (Abstr.) Ga. J. Sci. 35:66. The larval mines of three Lepidoptera and one Coleoptera have characteristics in chestnut leaves that can be distinguished on the basis of horizontal and vertical extension in the leaves, coloration, and area of leaf in which they occur. The larvae have distinctive methods of frass disposition or disposal, pupation, and escape from the leaf.
  269. Payne, J. A. 1978. Chinese chestnut production in the Southeastern United States: practice, problems, and possible solutions. In Proceedings American Chestnut Symposium, W. Va. University, Morgantown, W. Va., pp. 20-24. There are less than



- 400 acres of commercial chestnut orchards in the United States, with approximately half of these in the Southeast. Large numbers of Chinese chestnut seedlings are planted annually for home and game food production; however, knowledge about Chinese chestnuts, their propagation, fertilization, pests, harvest, storage and marketing is both scarce and lacking. Chinese chestnuts are sold in roadside markets and local farmers' markets. There is no commercial marketing because the domestic supply is low and unpredictable. However, 10 million lb of European chestnuts are imported annually to satisfy the U.S. market.
270. Payne, J. A. 1978. Oriental chestnut gall wasp: new nut pest in North America. In Proceedings American Chestnut Symposium, W. Va. University, Morgantown, W. Va., pp. 86-88. The oriental gall wasp, a recently discovered pest in the United States, threatens the chestnut industry in this country. The wasp attacks the vegetative buds and disrupts the shoot growth of the American chestnut, Chinese chestnut, and Japanese chestnut.
  271. Payne, J. A.; Barry, R. M.; Harris, E. D.; Polles, S. G.; and Wehunt, E. J. 1975. Pecan weevil: field evaluation of foliar and soil pesticides. *Proc. Southeast. Pecan Grow. Assoc.* 68:67-71. Data are presented that show carbaryl at 3.2 lb/acre applied to the foliage gave 98 and 95 percent weevil-free nuts when applied on a 7- and 10-day schedule, respectively. Results with soil pesticides were inconclusive.
  272. Payne, J. A.; Barry, R. M.; Harris, E. D.; Polles, S. G.; and Wehunt, E. J. 1975. Pecan weevil: field evaluation of foliar and soil pesticides. *Pecan South* 2:136-137. These data have been reported in No. 271.
  273. Payne, J. A.; Blythe, J. L.; Lowman, H.; and Yonce, C. E. 1973. Response of laboratory-reared adult plum curculios to ultraviolet radiation. *Ann. Entomol. Soc. Am.* 66:1007-1009. Plum curculios were shown responding to blacklight for up to 2,200 ft. Other types of fluorescent color lamps were not as attractive.
  274. Payne, J. A., and Ellis, H. C. 1978. Pecan serpentine leafminer: biology and control. *Proc. Ga. Pecan Grow. Assoc.* 9:33-37. Larvae of Nepticula juglandifoliella Clemens make narrow serpentine mines in the upper surface of pecan foliage. In Georgia, they mine leaves from April until November and complete four generations. Information on biology, damage and control of this lepidopteran leafminer is presented.
  275. Payne, J. A., and Ellis, H. C. 1978. Pecan serpentine leafminer: biology and control. *Pecan South* 5:252-255. These data were also published by the authors in No. 274.
  276. Payne, J. A.; Ellis, H. C.; and Harris, E. D. 1975. Hickory shuckworm: biology, life history and control. *Pecan South* 2:184-185. This is a popular article that discusses the biology and life history of the hickory shuckworm as well as its cultural and chemical control. Torak, EPN, and carbaryl gave 90 percent or better control when applied on a 7-10 day schedule, but EPN had 20 percent of the nuts damaged by the pecan weevil.
  277. Payne, J. A.; Ellis, H. C.; and Lockwood, D. W. 1978. Biology and distribution of the pecan weevil in Georgia and Tennessee. *Proc. Ga. Pecan Grow. Assoc.* 9:82-89. This is a general paper concerning the biology, damage, and distribution of the pecan weevil. No new data are presented.
  278. Payne, J. A.; Ellis, H. C.; and Lockwood, D. W. 1979. Biology and distribution of the pecan weevil in Georgia and Tennessee. *Pecan South* 6:30-33. This paper was also published by the authors in No. 277.
  279. Payne, J. A.; Gentry, C. R.; and Sparks, D. 1977. Pecan bud moth: control with soil-applied systemics and foliar sprays. *J. Ga. Entomol.*



- Soc. 12:236-241. Results of control tests with seven insecticides for the pecan bud moth are reported. Both aldicarb and carbofuran gave some control when applied as granules, but significant infestations were still present. In addition, carbofuran induced severe phytotoxicity. Phosalone and methomyl were the outstanding materials when applied as foliar sprays, but neither gave satisfactory control after 3 days.
280. Payne, J. A., and Green, R. A. 1977. An evaluation of fruit of the dwarf papaw, Asimina parviflora. Annu. Rep. North. Nut Grow. Assoc. 68:103-106. The description, fruit size, percentage of flesh, and fruit-ripening time for the dwarf papaw are given. The conclusion is reached that the dwarf papaw offers very little promise as a fruit tree, but it may have a place in a breeding program.
281. Payne, J. A.; Green, R. A.; and Lester, C. D. 1976. New nut pest: an Oriental chestnut gall wasp in North America. Annu. Rep. North. Nut Grow. Assoc. 67:83-86. These data were also published by Payne in No. 269.
282. Payne, J. A.; Harris, E. D.; and Lowman, H. 1976. Foliar insecticides for control of pecan weevil and hickory shuckworm. J. Ga. Entomol. Soc. 11:306-308. Nine foliar pesticides were evaluated for control of the pecan weevil and the hickory shuckworm. All nine insecticides gave 90 percent or better control of the shuckworm when applied on a 7-, 10-, or 14-day schedule. Control of the pecan weevil was more difficult, and 7- to 10-day applications with the better materials were required to give adequate control. Some of these data can also be found in No. 276.
283. Payne, J. A.; Hart, W. G.; Davis, M. R.; Jones, L. S.; and Weaver, D. J. 1972. Using aerial photography with infrared film to locate pecan pests and diseases. Pecan Q. 6:4-6. These data are also published by the authors in No. 285.
284. Payne, J. A.; Hart, W. G.; Davis, M. R.; Jones, L. S.; and Weaver, D. J. 1972. Aerial photography with infrared film for detection of pecan pests and diseases. Proc. Ga. Pecan Grow. Assoc. 3:14-20. This paper is the same as that published in Nos. 283 and 285.
285. Payne, J. A.; Hart, W. G.; Davis, M. R.; Jones, L. S.; Weaver, D. J.; and Horton, B. D. 1971. Detection of peach and pecan pests and diseases with color infrared aerial photography. Proc. Bienn. Workshop Color Aerial Photogr. Plant Sci., Gainesville, Fla., 3rd, pp. 216-230. Aerial photography with infrared film from elevations of 600 to 4,500 ft appeared promising as a method of surveying for peachtree short life, phony disease, mites, root borers, yellow aphids, black pecan aphids, bunch disease, and clitocybe root rot.
286. Payne, J. A., and Heaton, E. K. 1975. The hickory shuckworm: its biology, effect upon nut quality, and control. Annu. Rep. North. Nut Grow. Assoc. 66:19-25. This is a popular article on shuckworms and contains the same information presented in No. 276.
287. Payne, J. A., and Johnson, W. T. 1979. Plant pests. In Nut Tree Culture in North America, pp. 314-395. W. F. Humphrey Press, Geneva, N.Y. This paper is a book chapter and is a very thorough treatment of the diseases and insects attacking pecan, hickory, chestnut, filbert, and walnut.
288. Payne, J. A.; Jones, L. S.; and Lowman, H. 1972. Biology and control of a nut curculio. Conotrachelus carinifer Casey, a new pest of chestnuts. Annu. Rep. North. Nut Grow. Assoc. 63:76-78. The nut curculio, an insect widely distributed in the Southeast on oak, is reported as infesting chestnuts in Fort Valley and Stone Mountain, Ga. Adults were found in trees from June through September even though oviposition does not occur until September after the buds on chestnuts have opened. The larval period requires 20 to 26 days to complete

- development. Overwintering was as mature larvae in smooth-walled earthen cells at a depth of about 4 to 8 inches. The larvae pupate in May with adult emergence in June. Toxaphene applied on three dates was the only insecticide giving significant control.
289. Payne, J. A.; Jones, L. S.; Wehunt, E. J.; and Lowman, H. 1972. Biology and control of the small chestnut weevil, Curculio sayi Gyllenhal. Annu. Rep North. Nut Grow. Assoc. 63:78-82. Adult weevils were found to emerge from the soil under chestnut trees from early May to late June. However, oviposition rarely occurred until the buds opened in late August or early September. The larval period lasted 3-5 weeks, and usually a single nut contained an average of five larvae/nut. After development, the larvae entered the soil and constructed cells about 3-5 inches deep; they remained as larvae until the following autumn. Pupation then occurred and lasted about 4 weeks before pupae changed to adults. The adults stayed in the soil over the second winter and emerged from the ground the following spring, about 20 months after entering the soil. Some larvae remained in the larval stage for 2 years, thus extending the life cycle to 3 years. The best control was obtained with three applications of toxaphene applied to the foliage in August and September. The nematocide EDB gave excellent control of larvae under laboratory conditions.
290. Payne, J. A., and Kays, Stanley J. 1978. Ethephon for removal of shucks from insect-infested pecan fruits. J. Econ. Entomol. 71:5-6. All tested concentrations of ethephon significantly increased dehiscence (after 5 days) in pecans that had been infested with the pecan weevil or hickory shuckworm. This permitted significantly higher recovery of the insect species from infested nuts for laboratory or field studies. The ethephon when applied directly to pecan weevils caused no reaction. Dehiscence was not enhanced in nuts treated with ethylene at any concentration.
291. Payne, J. A.; Lowman, H.; and Pate, R. R. 1975. Artificial diets for rearing the tilehorned prionus. Ann. Entomol. Soc. Am. 68:680-682. Five diets formulated with and without pecan wood were successfully developed for rearing the tilehorned prionus. Larvae as large as 14 g were obtained in 400 days, and artificial diets did not shorten the insect's natural life cycle of 3 to 5 years.
292. Payne, J. A.; Malstrom, H. L.; and KenKnight, G. E. 1979. Insect pests and diseases of the pecan. U.S. Sci. Educ. Admin. Agric. Rev. Man. South. Ser. 5, 43 pp. This publication is a complete listing and discussion of the diseases and insects that attack pecans. It is a very good publication and is of particular value to the person wishing an overall view of pecan pests.
293. Payne, J. A.; Menke, A. S.; and Schroeder, P. M. 1975. Dryocosmus kuriphilus Yasamatsu (Hymenoptera: Cynipidae), an Oriental chestnut gall wasp in North America. U.S. Dep. Agric. Coop. Econ. Insect Rep. 25(49-52):903-905. The life history, damage, distribution, and descriptions of the life stages of the Oriental chestnut gall wasp are given.
294. Payne, J. A.; Menke, A. S.; and Schroeder, P. M. 1976. New nut pest: an Oriental chestnut gall wasp in North America. Annu. Rep. North. Nut Grow. Assoc. 67:83-86. This paper contains the same data published in No. 293.
295. Payne, J. A.; Nash, R. F.; and Gentry, C. R. 1974. Here's the problem: how to treat leafminers. Pecan Q. 8:28-30. This paper reports the biology and damage caused by the leafminers Nepticula juglandifoliella and Lithocolletis caryaefoliella. Control was obtained by the use of dimethoate and phosalone.
296. Payne, J. A.; Nash, R. F.; and Gentry, C. R. 1974. Biology and control of two pecan leafminers.



- Proc. West. Pecan Conf. 8:22-28. These data were also published in No. 295.
297. Payne, J. A.; Pate, Ray; Blythe, John; and Yonce, C. E. 1976. Lesser peachtree borer: a mechanical separator for extracting cocoons from rearing trays. J. Ga. Entomol. Soc. 11:366-369. A mechanical separator was designed that permits extraction of 3,000 cocoons of the lesser peachtree borer per hour from pupation medium.
  298. Payne, J. A., and Polles, S. G. 1974. Pecan: A new host for tobacco budworms and corn earworms. J. Econ. Entomol. 67:295-296. Heliothis zea and H. virescens are reported as feeding on pecan buds and nutlets in Tennille, Byron, Perry, Plains, and Waycross, Ga. This is the first record of Heliothis attacking pecans.
  299. Payne, J. A.; Polles, S. G.; and Lowman, H. 1973. Field evaluation of soil and foliar pesticides for control of the small chestnut weevil. Annu. Rep. North. Nut Grow. Assoc. 64:78-80. Soil and foliar pesticides for control of the small chestnut weevil are reported in this paper, which is an extension of the research reported in No. 289. The pesticides chlorpyrifos and pirimiphosethyl when applied to the soil as granules gave better control than three other chemicals and the check. In foliar tests, toxaphene, EPN and metoxychlor gave unsatisfactory control of adults.
  300. Payne, J. A.; Polles, S. G.; and Lowman, H. 1974. Field and laboratory evaluation of foliar pesticides for control of the small chestnut weevil. Annu. Rep. North. Nut Grow. Assoc. 65:43-44. Insecticide tests were conducted under field and laboratory conditions in 1973 to control the small chestnut weevil. Carbaryl gave the best control under field conditions, and all treatments except carbaryl plus molasses gave 100 percent control of weevils 2 days postharvest in the laboratory. Only toxaphene plus azinphosmethyl and EPN gave complete control in the laboratory at 7 and 14 days posttreatment.
  301. Payne, J. A.; Polles, S. G.; and Lowman, H. 1975. Biology and control of the small chestnut weevil, Curculio sayi (Coleoptera: Curculionidae). J. Ga. Entomol. Soc. 10:235-241. This is a paper that ties data presented in three earlier papers into a single presentation and is therefore the most comprehensive on the small chestnut weevil's biology, importance, and control. The other papers are Nos. 289, 299, and 300.
  302. Payne, J. A.; Polles, S. G.; Sparks, D.; and Wehunt, E. J. 1976. The distribution, economic importance, and chemical control of the tilehorned prionus (Coleoptera: Cerambycidae) in Georgia. J. Ga. Entomol. Soc. 11:9-16. Thirteen pesticides were evaluated in soil under both field and laboratory conditions for control of the tilehorned prionus. None of the materials tested gave complete control of larvae. Carbofuran, EDB, methomyl, and Sarolex caused significant weight losses and had a delayed effect on mortality after exposure. Only EDB gave 50 percent or better control in any tests.
  303. Payne, J. A.; Polles, S. G.; and Wehunt, E. J. 1974. Pecan weevil: biology and control. Annu. Rep. North. Nut Grow. Assoc. 65:134-144. This publication restates data presented in other papers (Nos. 351, 352, and 360) on control of the pecan weevil with soil and foliar pesticides under field and laboratory conditions.
  304. Payne, J. A., and Schwartz, P. H., Jr. 1971. Feeding of Japanese beetles on Phylloxera galls. Ann. Entomol. Soc. Am. 64:1466-1467. The galls of Phylloxera formed on leaves of pignut hickory and pecan (in Loudoun County, Va.) were noted as attacked by Japanese beetles. Feeding was confined almost entirely to the gall.
  305. Payne, J. A., and Sparks, D. 1978. Winter injury of pecan varieties in the nursery. Pecan South 5:118-119. These data are also published in Nos. 500 and 501.

306. Payne, J. A., and Sparks, D. 1978. Pecan foliage susceptibility to dodine. Plant Dis. Rep. 62:996-998. The sensitivity of 50 pecan cultivars to the fungicide dodine is reported. The 'Barton' variety was the most sensitive genotype but others also showed light to severe burning of the foliage.
307. Payne, J. A., and Sparks, D. 1979. Susceptibility of pecan foliage to Cyprex. Pecan South 6:28-30. These data are also reported by the authors in the Plant Dis. Rep. 62:946-948. In this paper, the foliage susceptibility of 48 additional pecan genotypes to Cyprex is reported.
308. Payne, J. A.; Sparks, D.; and Jones, L. S. 1974. Prionus root borers: effects on nutrition, growth and yield of pecan, Carya illinoensis Koch. Annu. Rep. North. Nut Grow. Assoc. 65:33-42. Data presented in this paper can be found in Nos. 505 and 506.
309. Payne, J. A., and Tedders, W. L. 1978. Pecan insects - current and potential problems in California. In Proceedings California Pecan Growers Conference, pp. 34-42. The pecan insect situation in California is briefly discussed in a popular format, and the general biology, economic importance, and control of important species are given. Included are the yellow aphids, black pecan aphid, leafminers, stink bugs, plant bugs, fall webworm, pecan bud moth, Phylloxera, pecan nut casebearer, hickory shuckworm, and the pecan weevil.
310. Payne, J. A., and Tedders, W. L. 1978. Pecan pest research. Dep. Agric. For. Serv., Gen. Tech. Rep. NC-52, pp. 94-99. This is a popular pecan insect review paper that is very similar to the one published in No. 309 except that the nut curculio, mites, obscure scale, and pinhole and shothole borers are also included.
311. Payne, J. A.; Tedders, W. L.; Cosgrove, G. E.; and Foard, Don. 1972. Larval mine characteristics of four species of leafmining Lepidoptera in pecan. Ann. Entomol. Soc. Am. 65:74-81. The larval mines of four leafmining Lepidoptera species in pecan leaves are characterized based on the horizontal and vertical extension in the leaflet, coloration, and area of the leaf in which they occur.
312. Payne, J. A.; Tedders, Walker L.; and Gentry, C. R. 1970. Pecan borers threaten Georgia's crop yields. Pecan Q. 4:3-4. The identification of Prionus root borers in pecan is made along with data on the life stages and damage caused to pecan.
313. Payne, J. A.; Tedders, W. L.; and Gentry, C. R. 1970. A serpentine leafminer, Nepticula juglandifoliella Clemens, a new pest of pecan. Proc. Southeast. Pecan Grow. Assoc. 63:32-35. Infestation of the serpentine leafminer, a pest of hickory, walnut, and butternut, is reported from pecan. Eggs are placed on the upper surface of leaves during late June or early July. The larvae hatch and eat directly through the bottom of the egg shell and into the leaf. The larvae begin to make mines up to 2 inches long by eating the cells beneath the epidermis. Mature larvae leave the leaf and pupate among the ground litter. Intense infestations cause the leaves to brown, curl, and become brittle, and finally drop. Controls are currently not available, but GS-13005 and dialifor appeared effective.
314. Payne, J. A.; Tedders, W. L.; and Gentry, C. R. 1970. Root-boring insects of pecan. Proc. Annu. Conf. Ga. Pecan Grow. Assoc., 5th, 1:4-9. This article was reprinted from No. 312.
315. Payne, J. A.; Tedders, Walker L.; and Gentry, C. R. 1971. Biology and control of a pecan serpentine leafminer, Nepticula juglandifoliella. J. Econ. Entomol. 64:92-93. These data are also published by the authors in No. 313.
316. Payne, J. A.; Tedders, W. L.; and Gentry, C. R. 1972. Prionus root borer, a new pest of pecan. Prog. Farmer 87:47. These data are also



- published by the authors in Nos. 312 and 314.
317. Payne, J. A., and Wells, J. M. 1973. Postharvest control of the pecan weevil. (Abstr.) Proc. Southeast. Pecan Grow. Assoc. 66:113. Experimental hot-water dips of inshell pecans with and without shucks at 170° F for 3 minutes and 140° F for 5 minutes gave 100 percent control of pecan weevil and shuckworm larvae. Cold storage at 0° F for 2 weeks also gave 100 percent weevil and shuckworm larvae control. Taste panelists could not distinguish between kernels from the treated pecans and those from the untreated checks on the basis of appearance, texture, or flavor.
  318. Payne, J. A., and Wells, J. M. 1974. Postharvest control of the hickory shuckworm and the pecan weevil in inshell pecans. Proc. West. Pecan Conf. 8:29-35. This is a more detailed presentation of the data published in No. 319. When inshell pecans with and without shucks were dipped in hot water for 3 minutes (170° F) or for 5 minutes (140° F), all larvae of the hickory shuckworm and the pecan weevil were killed. Also, steam treatment for 3 minutes gave 100 percent control of both pests as did cold storage at 0° F for 1 week. The hot-water treatment also greatly reduced mycoflora populations in the kernel and shell.
  319. Payne, J. A., and Wells, J. M. 1974. Postharvest control of the pecan weevil in inshell pecans. J. Econ. Entomol. 67:789-790. A 3-minute steam treatment, a 3-minute dip in 77° C water, a 5-minute dip in 60° C water or a 1-week storage at -18° C will give 100 percent control of pecan weevils in whole pecans. None of the treatments altered the quality of the pecans or provided some control of microorganisms. Procedures for in-nut control are needed to prevent the spread of the weevil into unfested areas of the pecan belt.
  320. Payne, J. A., and Wells, J. M. 1976. Toxic penicillia isolated from lesions of kernel-spotted pecans. (Abstr.) Am. Chem. Soc. Southeast. Reg. Meet. 28:164. The incidence of kernel spot lesions of pecans caused by feeding punctures of the southern stinkbug was 1.8 percent for the thick-shelled cultivar 'Stuart' and 3.5 percent for the thin-shelled cultivar 'Schley'. Of 730 lesion sections plated, 46.3 percent harbored fungi, 15.5 percent of which belonged to the genus Penicillium. Other genera isolated were Alternaria and Epicoccum (41.1 percent), Pestalotia and Monochaeta (9.2 percent), Phoma (6 percent), Fusarium (4.7 percent), Cladosporium (4.2 percent), Aspergillus (0.8 percent), and others. Thirteen of the 59 Penicillium isolates were persistently toxic to day-old cockerels over a 1-year testing period. Seven of the toxic isolates were P. terrestris, two were P. cyclopium, and one each were P. funiculosum, P. frequentans, P. ochraceum, and P. citrinum. The metabolite responsible for the toxicity of P. citrinum was citrinin; the identity of the toxins of the other isolates is under investigation.
  321. Payne, J. A., and Wells, J. M. 1979. Postharvest control of the small chestnut weevil in inshell chestnuts. J. Econ. Entomol. 71:894-895. Postharvest treatment of inshell Chinese chestnuts in 52° C water and 52° C water containing 450 µg 1 ml of the fungicide DCNA for 45 minutes killed all larvae of the small chestnut weevil. These treatments also reduced population of mycoflora in the kernel and shell by 60 percent without detriment to nut quality or germination.
  322. Peterson, D. L., and Monroe, G. E. 1974. Automatic shaker-sequencing operation for tree crops. Trans. ASAE 17:623- 626. Continuous automatic shaker operation is practical for increasing mechanical thinning rates. With the completion of a dependable catching-surface seal now under development, the continuous operation should

- significantly improve mechanical harvesting rates and the economics of mechanical harvesting. The one-button automated stop-go sequence is adaptable to most commercial harvesters and should be effective in reducing operator fatigue and increasing harvesting rates.
323. Peterson, D. L., and Monroe, G. E. 1974. Automatic shaker operation for thinning and harvesting tree crops. Proc. Natl. Conf. Fluid Power, 30th, 28:52-60. A machine and control system was developed that moves continuously along a tree row while the several shaker functions are controlled automatically. The shaker, when positioned around a tree trunk, is free to slide along a track support system. One-button automatic operation, while the machine is stopped at each tree, was also made possible. Development of the automated electric hydraulic control system is described in detail.
  324. Peterson, D. L., and Monroe, G. E. 1976. Hydraulic tree shaker harvests crops automatically. Hydraul. and Pneum. 29:84-86. This is a similar paper to that published in No. 323.
  325. Peterson, D. L., and Monroe, Gordon E. 1977. Continuously moving peach harvester. Proc. Annu. S.C.-Ga. Peach Conv., 6th, 5 pp. This paper is not available from the National Agricultural Library.
  326. Peterson, D. L., and Monroe, G. E. 1977. Continuously moving shake-catch harvester for tree crops. Trans. ASAE 20:202-205, 209. This paper describes a harvester that allows for continuous movement along a tree row while shake-removing and collecting the crop. Harvesting rates of over 200 trees/h were obtained. Both fruit removal and recovery were over 90 percent.
  327. Peterson, D. L., and Monroe, G. E. 1977. New pecan harvesting equipment. Pecan South 4:201-203. This is a popular presentation of data presented in Nos. 326 and 328.
  328. Peterson, D. L., and Monroe, G. E. 1977. Pecan harvester for small-farm operators. Trans. ASAE 20:833-835. This paper contains the same data published in No. 327.
  329. Peterson, D. L., and Monroe, G. E. 1977. Mechanical harvesting system for Chinese chestnuts. Annu. Rep. North. Nut Grow. Assoc. 68:19-24. An inertia shaker and half-rollout catching frame was shown as an effective way of harvesting chestnuts, and the devices for removal and separation of burrs from chestnuts was also effective. About 4 to 9 percent of the chestnut crop must be allowed to drop naturally before the maturity is sufficient for mechanical harvesting.
  330. Peterson, D. L., and Monroe, G. E. 1978. Pecan harvester for small farmers. Pecan. Q. 12:5-7. This paper contains the same data published in No. 328.
  331. Peterson, D. L., and Monroe, G. E. 1978. Nut harvester for small orchards. Annu. Rep. North. Nut Grow. Assoc. 69:35-41. This paper contains data published in No. 328.
  332. Peterson, D. L., and Monroe, G. E. 1978. Pecan harvester for small farm operators. Proc. Southeast. Pecan Grow. Assoc. 71:187-192. This paper was also published in No. 328.
  333. Peterson, D. L., and Monroe, G. E. 1979. Catching surface seal and rotating trunk seal for a continuous tree crop harvester. U.S. Patent No. 4,160,357, July 1979. A continuous tree-crop harvester is fitted with right and left catching surfaces. The right-half catching surface is designed to move back and forth over the left-half catching surface. At the same time and without interrupting the forward motion of the harvester, a rotating truck seal is provided to enclose and seal the trunk of the tree to be harvested. Thus, sealing of the catching surface



- and tree trunk is reversed after harvesting, and the harvester is moved to the next crop harvesting position.
334. Phillips, Arthur M. 1960. Control of the black pecan aphid and pecan nut casebearer on pecans. Proc. Southeast. Pecan Grow. Assoc. 53:49-51. This paper contains no new data and discusses the general biology, distribution, method of overwintering, injury, and control of the black pecan aphid and pecan nut casebearer.
  335. Phillips, Arthur M. 1963. Aerial applications of parathion with Micronair Rotary Atomizers for control of the pecan bud moth. Proc. Southeast. Pecan Grow. Assoc. 56:86-91. The Micronair Rotary Atomizer spray unit was tested on pecans using parathion as a control for the pecan bud moth. Excellent spray coverage and control was obtained using the new aerial spray system.
  336. Phillips, Arthur M., and Cole, John R. 1945. Insects and diseases of the pecan in Florida. Fla. Agric. Exp. Stn. Bull. 411, 60 pp. This is an excellent bulletin that discusses the major insect and disease problems of pecan in Florida. It is written for the farmer and includes control recommendations for 1945. Revisions of the bulletin were published in 1952 (No. 337), 1960 (No. 338), and 1964 (No. 339).
  337. Phillips, Arthur M.; Cole, J. R.; and Large, J. R. 1952. Insects and diseases of the pecan in Florida. Fla. Agric. Exp. Stn. Bull. 499, 75 pp. This is a revision of No. 336.
  338. Phillips, Arthur M.; Large, J. R.; and Cole, J. R. 1960. Insects and diseases of the pecan in Florida. Fla. Agric. Exp. Stn. Bull. 619, 84 pp. This is the second revision of No. 336.
  339. Phillips, Arthur M.; Large, J. R.; and Cole, J. R. 1964. Insects and diseases of the pecan in Florida. Fla. Agric. Exp. Stn. Bull. 619-A, 87 pp. This is the third revision of No. 336.
  340. Pollard, H. N. 1962. Sex determination of fifth-instar nymphs of leafhoppers (Cicadellidae:Proconiini). Ann. Entomol. Soc. Am. 55:141. This paper describes a technique to sex nymphs of Oncometopia undata and O. nigricans. A center line in the last segment of the nymphs extends from the apex of the abdomen one-third the distance cephalad in males and the entire length of the segment in females.
  341. Pollard, H. N. 1965. Description of stages of Homalodisca insolita, a leafhopper vector of phony peach virus disease. Ann. Entomol. Soc. Am. 58:699-702. The life stages of H. insolita (Walker), a leafhopper vector of phony peach disease, are described. Illustrations of the different stages and male forewing are furnished.
  342. Pollard, H. N. 1965. Fecundity of Homalodisca insolita, a leafhopper vector of phony peach virus disease. Ann. Entomol. Soc. Am. 58:935-936. Observations of oviposition by virgin H. insolita females indicated that mating is essential for the production of viable eggs. Females also laid in clusters of 15-20 eggs and averaged 250-560 total eggs in their lifetime.
  343. Pollard, H. N., and Kaloostian. 1961. Overwintering habits of Homalodisca coagulata, the principal natural vector of phony peach disease virus. J. Econ. Entomol. 54:810-811. Repeated observations of the overwintering habits of H. coagulata, the principal natural vector of phony disease, confirmed that the insect passes the winter in the adult stage and that it does not hibernate. Since it must feed all winter long, it cannot survive in areas of prolonged freezing weather. Thus, its geographical distribution is limited to areas south of Atlanta and Athens, Ga.
  344. Pollard, H. N.; Turner, W. F.; and Kaloostian, G. H. 1959. Invasion of the Southeast by a western leafhopper, Homalodisca insolita.

- J. Econ. Entomol. 52:359-360. A leafhopper whose known range until 1950 was Texas, Mexico, and Arizona has invaded the Southeast and established itself as the dominant species of the tribe Proconiini in its new habitat. Since its discovery in the vicinity of Fort Valley, Ga. in 1950, H. insolita has been incriminated as a vector of the phony peach disease virus. Although an efficient experimental vector of this virus, its food and flight habits preclude its becoming an important natural vector.
345. Pollard, H. N., and Yonce, C. E. 1965. Significance of length of tibial spines relative to oviposition processes by some leafhoppers (Hemiptera:Cicadellidae). Ann. Entomol. Soc. Am. 58:594-595. The relationship between the length of the tibial spines and the presence of chalky deposits on the eggs of various leafhopper species is discussed.
346. Polles, S. G., and Payne, J. A. 1972. Attacking the pecan weevil. Proc. Ga. Pecan Grow. Assoc. 2:12-13. This is a popularized article very similar to one published in No. 348.
347. Polles, S. G., and Payne, J. A. 1972. An improved emergence trap for adult pecan weevils. J. Econ. Entomol. 65:1529. An emergence cage is described for detection of pecan weevil emergence.
348. Polles, S. G., and Payne, J. A. 1972. Pecan's No. 1 enemy-the weevil. Prog. Farmer, August, p. 24. A popular article that reviews the pecan weevil life cycle, damage, and detection methods available for farmers to use.
349. Polles, S. G., and Payne, J. A. 1973. Techniques for timing spray application to control the pecan weevil. Proc. Southeast. Pecan Grow. Assoc. 66:101-108. Seven different methods of detecting pecan weevil emergence are discussed and advantages and disadvantages of each one listed. The various methods are tree jarring, burlap bags, tree bands, stickem bands, Pyrenone sprays, cone cages, and pheromone traps.
350. Polles, S. G., and Payne, J. A. 1973. Pecan weevil: an improved method of sampling populations in pecan trees. J. Econ. Entomol. 66:519-520. This paper compares the traditional conical emergence cages and tree jarring to the insecticide knockdown method of using Pyrenone on selected trees to determine the presence of weevil populations. Data are presented that show the insecticide knockdown method to be nearly twice as effective in detecting adult weevils. The latter method also detected stink bugs, a pecan catocala, and the walnut caterpillar.
351. Polles, S. G., and Payne, J. A. 1973. Pecan weevil: toxicity of insecticides in laboratory tests. J. Econ. Entomol. 66:497-498. Seventeen insecticides were evaluated in the laboratory as controls for the pecan weevil. Two methods were used, a nut-dip and a residual-plate method. Dialifor, monocrotophos, carbofuran, carbaryl, malathion, methyl parathion, oxydemetonmethyl, EPN, and phosalone exhibited high toxicities. Both test methods gave similar results except for disulfoton which exhibited low toxicity in the plate test and high toxicity in the nut-dip test. Imidon shows a reverse effect.
352. Polles, S. G., and Payne, J. A. 1974. Pecan weevil, hickory shuckworm and yellow pecan aphid. Proc. Southeast. Pecan Grow. Assoc. 67:79-94. The biology, seasonal occurrence, damage, and control of the pecan weevil, hickory shuckworm, and yellow pecan aphid are given in good detail. This paper is an excellent selection for an overall review of the three insect pests.
353. Polles, S. G., and Payne, J. A. 1974. Walnut caterpillar and webworms of pecan. Proc. West. Pecan Conf. 8:51-56. This paper is a popularized publication on the webworm and walnut caterpillar. It



- covers the general biology, host range, damage, importance, and cultural and chemical control.
354. Polles, S. G., and Payne, J. A. 1974. Spraying for weevil control. Pecan South 1:4-5, 29. The pecan weevil is discussed from a popular standpoint. The life cycle, biology, economic significance, and control are presented.
  355. Polles, S. G., and Payne, J. A. 1974. Shuckworm and aphid control. Pecan South 1:4-6. The hickory shuckworm and yellow pecan aphid are discussed from a popular standpoint. The life cycle, biology, economic significance, and control are presented.
  356. Polles, S. G., and Payne, J. A. 1975. Webworm, walnut caterpillar can be controlled by spraying. Pecan Q. 9:6-7. A general discussion of the species is given that includes the life cycle, economic significance, and control. These pests cause little trouble in commercial orchards since they are controlled by insecticides used in the regular spray program.
  357. Polles, S. G., and Payne, J. A. 1980. Pictorial key to time spray applications for control of pecan phylloxera. Pecan South 7:6-7. Data and a schedule are presented for spray applications to control pecan phylloxera.
  358. Polles, S. G.; Payne, J. A.; and Jones, R. L. 1977. Attraction of the pecan weevil to its natural pheromone and grandlure. Pecan South 4:26-28. Traps baited with live virgin females or synthetic boll weevil pheromone were attractive to pecan weevils. Most of the captured insects were male, and the grandlure pheromone outcaught virgin females. Unbaited traps, male-baited traps, and female-male baited traps caught some adults, but the numbers were significantly lower than those from the pheromone or virgin female treatments.
  359. Polles, S. G.; Payne, J. A.; and Wehunt, E. J. 1972. Preliminary evaluation of soil applied pesticides for control of the pecan weevil. Proc. Southeast. Pecan Grow. Assoc. 65:33-34. In field tests, carbofuran, EDB, and DBCP gave significant control of the pecan weevil. However, DBCP was not significantly better in reducing adult weevil emergence than were azinphosmethyl, Sarolex, carbaryl, or encapsulated Diazinon.
  360. Polles, S. G.; Payne, J. A.; and Wehunt, E. J. 1973. Pecan weevil: control with soil-applied insecticides and nematicides. J. Econ. Entomol. 66:501-503. This paper reports in more detail the results already given in the paper published in the Proc. Southeast. Pecan Grow. Assoc. 65:33-34. Soil pesticides were evaluated for control of the larval and adult stages of the weevil in field and laboratory tests, and EDB and carbofuran gave better control than the other materials.
  361. Prince, V. E. 1966. Winter injury to peach trees in central Georgia. Am. Soc. Hortic. Sci. 88:190-196. The possible relationship between winter temperature patterns and tissue injury in the cambial zone of peach tree trunks and crotches was investigated during four winters in central Georgia. Injury was detected only on trees that had accumulated all or a substantial portion of the number of hours of chilling required to break their rest period and then were exposed to abnormally warm weather followed by a relatively sharp drop to below freezing temperature.
  362. Prince, V. E. 1966. Notice to fruit growers and nurserymen relative to the naming and release of the 'Sentinel' peach. Introduction notice on file Byron, Ga. The peach variety 'Sentinel' is officially released to producers by USDA.
  363. Prince, V. E. 1966. Notice to fruit growers and nurserymen relative to the naming and release of the 'Springold' peach. Introduction notice on file Byron, Ga. The peach variety 'Springold' is officially released to producers by USDA.

364. Prince, V. E. 1967. Winter injury to peach trees in the Southeast. In Proceedings Peach Tree Life Seminar, pp. 27-31. This paper is a restatement by the author of the data contained in No. 361.
365. Prince, V. E. 1969. Notice to fruit growers and nurserymen relative to the naming and release of the 'Springcrest' peach. Introduction notice on file Byron, Ga. The peach variety 'Springcrest' is officially released to producers by USDA.
366. Prince, V. E. 1970. Notice to fruit growers and nurserymen relative to the naming and release of the 'Summergold' peach. Introduction notice on file Byron, Ga. The peach variety 'Summergold' is officially released to producers by USDA.
367. Prince, V. E. 1971. Peach varieties requiring 650 to 800 hours of chilling. Proc. Natl. Peach Counc., 30th, pp. 110-112. This paper is not available from the National Agricultural Library.
368. Prince, V. E. 1972. Notice to fruit growers and nurserymen relative to the naming and release of the 'Springbrite' peach. Introduction notice on file Byron, Ga. The peach variety 'Springbrite' is officially released to producers by the USDA.
369. Prince, V. E. 1972. Notice to fruit growers and nurserymen relative to the naming and release of the 'Camden' peach. Introduction notice on file Byron, Ga. The peach variety 'Camden' is officially released to producers by the USDA.
370. Prince, V. E. 1976. Notice to fruit growers and nurserymen relative to the naming and release of the 'Sunbrite' peach. Introduction notice on file Byron, Ga. The peach variety 'Sunbrite' is officially released to producers by the USDA.
371. Prince, V. E. 1977. Planting trends and possible new varieties for the Southeast. Proc. Natl. Peach Counc., 30th, pp. 36. The trend in planting new peach trees in the Southeast is down. The total tree population in the States of Florida, Alabama, Georgia, South Carolina and North Carolina is approximately 6.5 million. This is a decrease of 40 percent since 1957. Plantings in the last 3 years indicate that total acreage may be stabilizing at about the present level. The variety picture has also changed in this period and is discussed.
372. Prince, V. E. 1980. Notice to fruit growers and nurserymen relative to the naming and release of the 'Durbin' peach. Introduction notice on file Byron, Ga. The peach variety 'Durbin' is officially released to producers by USDA.
373. Prince, V. E. 1980. Notice to fruit growers and nurserymen relative to the naming and release of the 'Sunland' peach. Introduction notice on file Byron, Ga. The peach variety 'Sunland' is officially released to producers by USDA.
374. Prince, V. E. 1980. Notice to fruit growers and nurserymen relative to the naming and release of the 'Starlite' peach. Introduction notice on file Byron, Ga. The peach variety 'Starlite' is officially released to producers by USDA.
375. Prince, V. E.; Havis, L.; and Scott, L. E. 1955. Effect on soil treatment in greenhouse study of the peach replant problem. Proc. Am. Soc. Hortic. Sci. 65:139-148. A greenhouse study was made on the problem of replanting old peach orchards to peaches. Treatments to the potted peach trees included high-magnesium lime, calcium sulfate, magnesium sulfate, sodium carbonate, steam sterilization, fumigation, nutrient-solution addition, and potassium fertilization. The most striking response was obtained from the addition of relatively low rates of the high-magnesium lime. Growth of trees in soil given this treatment was greater than that of trees grown in old-peach soil to which



- other treatments were applied. Steam sterilization and fumigation also gave somewhat greater growth of the trees.
376. Prince, V. E., and Horton, B. D. 1972. Influence of pruning at various dates on peach tree mortality. *J. Am. Soc. Hortic. Sci.* 97:301-305. In a site with a history of short life of peach trees, brown discoloration of trunk cambial area was greater in trees pruned in November or December than in trees pruned in January. Trees pruned in February had less discoloration than those pruned in January. Mortality was greater among trees pruned in November or December than among those pruned in January. Mortality was less in trees pruned in February than those pruned earlier. However, there was little injury and no tree death when trees were pruned on different dates on a site with no short-life problem.
377. Prince, V. E., and Okie, W. R. 1981. 'Sunland' peach. *HortScience* 16:570. The new peach cultivar 'Sunland' is released.
- 378a. Prince, V. E., and Okie, W. R. 1981. 'Durbin' nectarine. *HortScience* 16:348. 'Durbin' nectarine is an early midseason cultivar with medium-sized, attractive fruit. Under Southeastern conditions, 'Durbin's' size and disease resistance are superior to those of other nectarines.
- 378b. Prince, V. E. and Okie, W. R. 1981. 'Starlite' peach. *HortScience* 16:684. 'Starlite' peach is released to provide an early, white-fleshed peach for local markets. The fruit is larger and more uniform in size, shape, and maturity than 'Springtime', the leading white-fleshed cultivar in its season. It is semi-clingstone when ripe, with medium texture and good flavor. 'Starlite' ripens with 'Springold', about 3 days after 'Springtime', or 55 days before 'Elberta' at Byron.

## R

379. Raju, B. C.; Nyland, G.; Goheen, A. C.; Wells, J. M.; and Weaver, D. J. 1980. Serological relationships of rickettsia-like bacteria in diseased plants. (Abstr.) *Proc. Am. Phytopathol. Soc.*, p. 108. Serologically the rickettsialike organism associated with peach phony, plum leaf scald, and young tree decline of citrus were found to be closely related.
380. Reichelderfer, K.; Gentry, C. R.; Smith, J. S.; and Hunter, R. E. 1979. An economic evaluation of a pest management program on pecans. (Abstr.) *Proc. Southeast. Pecan Grow. Assoc.* 72:61. Data are presented from a pest management program that substituted one soil fumigation treatment every 3 years and a systemic insecticide application and blacklight traps for intraseasonal foliar sprays against insects and in which the number of fungicide applications was reduced. The IPM program exceeds the cost of conventional pest control by \$56.00/acre, but the average net return was \$345.00/acre higher.
381. Roberts, D. D.; Hunter, R. E.; and Campbell, D. C. 1977. Breeding for resistance to pecan scab. *Proc. Tex. Pecan Grow. Assoc.* 65:58-60. The breeding of pecan cultivars for resistance to scab is discussed in detail. In preliminary tests with nine different maternal parents, populations of seedlings with 'Elliott' and 'Curtis' as the maternal parents had the most scab resistance. In fact, these are the only maternal parents that yielded more seedlings resistant to scab than were classified as susceptible.

## S

382. Savage, E. F., and Prince, V. E. 1972. Performance of peach cultivars in Georgia. *Ga. Exp. Stn. Res. Bull.* 114, 224 pp. This bulletin contains a listing of all the peach cultivars that have been

- tested in Georgia. Also included are the origin, parentage, time of bloom, fruit color, fruit size, chilling hours, etc.
383. Savage, E. F., and Prince, V. E. 1977. An update of peach cultivars, 1972-1976. Ga. Exp. Stn. Res. Rep. 246, 19 pp. This research report is an update on No. 382 and gives data on new cultivars of peaches tested in Georgia.
  384. Savage, E. F.; Weinberger, J. H.; Luttrell, E. S.; and Rhoads, A. S. 1953. Clitocybe root rot -- a disease of economic importance in Georgia peach orchards. Plant Dis. Rep. 36:269-270. This survey shows that Clitocybe root rot is of general occurrence in peach orchards throughout both the major and minor peach growing sections of Georgia and that it occurs in orchards in both the Piedmont and Sandhill peach sections of South Carolina. In Georgia, Clitocybe root rot of peach trees is found mainly on land planted to peaches for periods ranging from 30 to 50 years.
  385. Schroeder, W. J. 1968. Determination of larval instars of the hickory shuckworm, Laspeyresia caryana. Ann. Entomol. Soc. Am. 61:1620-1621. A comparison of head capsule widths for laboratory-reared and field-collected hickory shuckworm larvae is made.
  386. Schroeder, W. J. 1969. Stimulation of mating and oviposition of hickory shuckworm moths by pecan nuts. J. Econ. Entomol. 62:1244-1245. The presence of pecan nuts in the cage or in the vicinity of the cage containing hickory shuckworm adults stimulated mating and oviposition of moths compared with cages void of pecan nuts.
  387. Schroeder, W. J. 1970. Rearing the pecan bud moth on artificial diet. J. Econ. Entomol. 63:650-651. The pecan bud moth was reared on a modified pinto bean diet, and the average maximum yield was 25 moths/container.
  - 388a. Schroeder, W. J., and Osburn, Max. 1969. Rearing the hickory shuckworm, Laspeyresia caryana, on artificial diet with notes on biology. Ann. Entomol. Soc. Am. 62:1401-1403. The hickory shuckworm was successfully reared through seven generations on an artificial diet containing soaked pinto beans, wheat germ, torula yeast, agar, and water. Five generations of diet-reared male and female larvae in individual 1-oz clear plastic cups were studied to determine larval and pupal development time and pupal weight. From 61 to 85 percent of larvae produced adults. The biology of adults reared on diet and of adults reared from larvae overwintering in the field was studied in a glasshouse.
  - 388b. Scott, D. H., and Weinberger, J. H. 1944. Inheritance of pollen sterility in some peach varieties. Proc. Am. Soc. Hortic. Sci. 45:229-232. Data regarding pollen condition of several varieties and selections are presented. In most cases, the peach varieties were perfect-flowered and self-fertile.
  389. Senter, S. D.; Lyon, B. G.; and Horton, B. D. 1975. Effects of different concentrations on succinic acid-2,2-dimethylhydrazide on the flavor of puree from fresh and canned freestone peaches. J. Food Sci. 40:1103-1104. Taste tests were conducted on peaches canned and pureed from fresh peaches that had been treated with various levels of succinic acid-2,2-dimethylhydrazide (SADH). A preference was shown for treated fruit, which suggests that SADH treated peaches caused an increase in organic constituents of the flavor of peaches or a decrease in those constituents that tend to mask the true peach flavor.
  390. Sherman, W. B.; Sharpe, R. H.; and Prince, V. E. 1972. Two red leaf characters associated with early ripening peaches. Hortic. Sci. 8:502-503. Two leaf-color characters, solid red and variegated red, are associated with early fruit ripening in peach. These color characters appear in leaves approaching senescence and can be scored in 1-year-old seedlings.



391. Smith, H. R.; Richardson, E. G.; Yonce, C. E.; and Jacklin, S. W. 1969. A method of rearing the peachtree borer on artificial diet. *J. Econ. Entomol.* 62:961-962. The successful rearing of 17 normal moths from 40 larvae is reported from an artificial diet. The diet had to be changed several times because of the long life cycle, but the technique did provide a beginning method for rearing.
392. Smith, J. S., Jr. 1978. S-2 blacklight trap for capturing pecan Lepidoptera. *U. S. Agric. Res. Serv. [Rep.] ARS-S-175*, 5 pp. The construction and design of an improved blacklight trap for capturing pecan insects is given.
393. Smith, J. S., Jr. 1979. Light traps for surveying and controlling of Lepidopterous pests of tobacco and pecans. *In* *Proceedings of a Conference on Movement of Selected Species of Lepidoptera in the Southeastern United States (1978)*. Sec. IV, Chap. 16, pp. 249-256. This paper is a summary of research conducted on light traps by the author at several locations including Georgia and Louisiana. The conclusion is made that light traps can control certain insects and is a useful survey tool for many night flying species.
394. Smith, J. S., Jr. 1979. Dilute and concentrated pesticide spraying in pecan orchards. *Pecan South* 6:42-44. A comparison is made between two types of orchard sprayers for applying pesticides in mature pecan trees. One type applied pesticide in dilute form and the other applied the material in a highly concentrated form. The control of the hickory shuckworm, pecan scab, and the control of aphids and mites for foliage retention were used as a measure of the effectiveness of the spray equipment. Results obtained indicated that good control was provided on mature pecan trees by both types of sprayers.
395. Smith, J. S., Jr. 1979. Using low-volume and dilute pesticide sprayers in pecan production. *Proc. Southeast. Pecan Grow. Assoc.* 72:87-91. The data presented in this paper are also given in No. 394.
396. Smith, J. S., Jr.; Gentry, C. R.; Edwards, G. W.; and Blythe, J. L. 1975. Use of blacklight traps to suppress Lepidopteran insects on pecans. *Trans. ASAE* 18:707-710. In 3 years of testing, the infestation of hickory shuckworm was reduced through the use of light traps to the threshold of economic importance (25-30 percent) for 2 years and to one-half the level of economic importance during the third year. Damage caused by other Lepidopteran insects was not detected in the orchard.
397. Smith, J. S., Jr.; Gentry, C. R.; Edwards, G. W.; and Blythe, J. L. 1975. Blacklight traps for pecan pests. *Agric. Res.* 23(12): 16. This paper is an agricultural note that reports that blacklight traps produced a 70 percent reduction in shuckworm infestation in pecans over a 3-year period.
398. Smith, J. S., Jr.; Stanley, J. M.; and Gupton, R. N. 1973. Time-interval collecting device for insect traps. *U. S. Agric. Res. Serv. [Rep.] ARS-S-20*, 5 pp. This paper contains the construction and operational procedure for a programmable time-interval collecting device for use with insect traps.
399. Smith, J. S., Jr.; Stanley, J. M.; Hartsock, J. G.; and Campbell, L. E. 1974. S-1 blacklight insect survey trap plans and specifications. *U. S. Agric. Res. Serv. [Rep.] ARS-S-31*, 8 pp. Detailed plans and specifications are given for the S-1 blacklight insect survey trap.
400. Smith, J. S., Jr., and Tedders, W. L. 1978. S-2 blacklight trap for capturing certain pecan insects. *Pecan South* 5:172-174. A new light trap, designated as the S-2 trap, was constructed for use as a survey and control tool for pecan insects. The new trap caught up to

- five times as many hickory shuckworms during high population levels as did the 6-watt trap. The new trap is described in this paper.
401. Smith, J. S., Jr., and Tedders, W. L. 1980. Light measurements for studying sooty mold growth on simulated pecan foliage. *Trans. ASAE* 23:481-484. A system was designed and constructed for studying sooty mold growth on simulated pecan foliage. Monochromatic light intensity levels were measured through glass microscope slides with and without sooty mold accumulations on them. Measurements were made within the 400 to 700 nm waveband to cover the spectrum of primary photosynthesis. Weekly and seasonal accumulations of sooty mold growth were determined. The cleansing effects of rainfall in removing sooty mold accumulations were measured. At times, foliage shading by sooty mold growth exceeded 50 percent. All wavelengths within a 15-nm-wide waveband at the measured intervals were equally absorbed by sooty mold.
  402. Smith, J. S., Jr.; Tedders, W. L.; and Gentry, C. R. 1973. Blacklight trapping of the hickory shuckworm moth in Georgia pecan orchards. *Trans ASAE* 16:127-128. Blacklight traps reduced shuckworm damage below economic levels in 3 of 4 years near Sasser, Ga. (two traps/acre) but failed to provide economic control in an orchard in Byron (four traps/acre).
  403. Smith, J. S., Jr.; Yonce, C. E.; Edwards, G. W.; and Gentry, C. R. 1972. Capturing male peachtree borers (*Lepidoptera:Aegeriidae*) in traps baited with virgin females. *J. Ga. Entomol. Soc.* 7:229-233. An electrocuting grid trap and a sticky trap baited with virgin females were found equally effective in capturing male peachtree borer moths. In release and recapture experiments, about 30 percent of release moths were recovered. Apparently, the peach-tree borer pheromone is detectable for about 100 m.
  404. Snapp, Oliver I. 1921. Save the 1921 peach crop. *U.S. Bur. Entomol. Circ.* E-104, 4 pp. This paper is not available from any source.
  405. Snapp, Oliver I. 1921. Blister beetle injury to peaches. (Note) *J. Econ. Entomol.* 14:358. Blister beetles caused considerable injury in a peach orchard at Marshallville, Ga. on March 10, 1920. The trees were in full bloom on that date, and the beetles attacked the blossoms, eating through the calyx and then devouring the pistil.
  406. Snapp, Oliver I. 1922. Arsenate of lead spray for plum curculio kills grasshoppers. (Note) *J. Econ. Entomol.* 15:247. The large winged American locust was found causing considerable feeding damage to small green peaches in the peach belt of Georgia during 1921. Most of the damage was noted just prior to the third lead arsenate treatment for plum curculio, and following this application most of the locusts were killed.
  407. Snapp, Oliver I. 1923. Pick up and destroy peach 'drops'. *U.S. Bur. Entomol. Circ.* E-233, 1 p. This paper shows the importance of picking up drops to control the plum curculio.
  408. Snapp, Oliver I. 1924. Directions for the use of lubricating-oil emulsions for the control of the San Jose scale on peach trees. *U.S. Bur. Entomol. Circ.* E-253, 2 pp. Lubricating-oil emulsions, whether made from the boiled or cold-pumped formulas, or purchased from manufacturers, have proven effective for the control of the San Jose scale on peach trees when used at a 2-percent strength during the dormant season. Peach leaf-curl, a disease that occurs in the spring and is manifested by swollen and distorted leaves and twigs, can be controlled by adding bordeaux mixture, 4-4-50 strength, to the oil-emulsion spray.
  409. Snapp, Oliver I. 1924. Three years of paradichlorobenzene experiments in the South. *J. Econ. Entomol.* 17:253-259. Experiments for control of peachtree borer showed



- that large dosages of paradichlorobenzene exposed for short periods are not as effective as smaller dosages exposed for 4 to 6 weeks. Applications in October and November gave 75 percent control and those made in April gave 70 percent. December applications gave no control.
410. Snapp, Oliver I. 1926. Airplane dusting of peach orchards. *J. Econ. Entomol.* 18:450-459. About 1,000 acres of peach orchards were commercially dusted from airplanes in Georgia in 1925, and the quality of the fruit from these orchards equaled that from orchards dusted by ground machines. The airplanes flew from 10 to 20 feet above the trees at a speed of about 85 mph. This is the first time experiments were conducted with airplane application of pesticides on peaches.
411. Snapp, Oliver I. 1927. Directions for the use of paradichlorobenzene in controlling the peachtree borer. *U.S. Bur. Entomol. Circ.* E-269, 2 pp. Complete instructions on the use of paradichlorobenzene as a means of controlling the peachtree borer are given. Included is proper tree age, dosage, when to apply, how to prepare the soil, and how to apply the material. This paper was revised in 1930 (No. 418).
412. Snapp, Oliver I. 1927. Spray and dust schedules for Georgia peaches. *U.S. Bur. Entomol. Circ.* E-270, 2 pp. This paper contains insecticides and fungicides recommended for control of peach diseases and insects in 1927.
413. Snapp, Oliver I. 1927. The status of the oriental peach moth in the South. *J. Econ. Entomol.* 20:691-695. The oriental peach moth was reported in Georgia for the first time in 1923, and it was believed to have been shipped in on apples. Life history studies showed 5 to 6 generations a year, but it is not considered an economic pest in Georgia.
414. Snapp, Oliver I. 1928. A preliminary report on the toxic value of fluosilicates and arsenicals as tested on the plum curculio. *J. Econ. Entomol.* 21:175-178. Sodium fluosilicate without lime was the most toxic insecticide tested against the curculio, but it was also toxic to the peach foliage. Lime corrected the burning but destroyed its toxicity as an insecticide. Arsenate of lead with lime as a dust or spray gave good curculio control.
415. Snapp, Oliver I. 1929. Spray and dust schedules for southern peaches. *U.S. Bur. Entomol. Circ.* E-270 (rev.), 2 pp. This paper contains insecticide and fungicide recommendations for control of peach diseases and insects in 1929.
416. Snapp, Oliver I. 1929. Directions for the use of lubricating-oil emulsions for the control of the San Jose scale on peach trees. *U.S. Bur. Entomol. Circ.* E-253 (rev.), 2 pp. Lubricating-oil emulsions, whether homemade or purchased from manufacturers, have proven effective for 6 years in controlling the San Jose scale on dormant peach trees. Peach leaf-curl can be controlled by adding bordeaux mixture, 4-4-50 strength, to the oil-emulsion spray.
417. Snapp, Oliver I. 1929. The oriental fruit moth, a pest of peaches in Georgia. *Ga. Exp. Stn. Press Bull.* 296, 2 pp. The first appearance of the oriental fruit moth in Georgia was during 1923, and it is reported as statewide by 1929. Considerable damage is sometimes caused to late peaches or apples. The characters of the injury, life history, habits, and control measures for the species are given.
418. Snapp, Oliver I. 1930. 1930 spray and dust schedule for southern peaches. *U.S. Bur. Entomol. Circ.* E-270 (rev.), 3 pp. This paper contains insecticide and fungicide recommendations for control of peach diseases and insects in 1930.
419. Snapp, Oliver I. 1930. Lubricating oil emulsions for the control of the San Jose scale on peach trees.

- U.S. Bur. Entomol. Circ. E-282 (rev.), 3 pp. This paper reports final results of 8 years' experimentation with oil emulsions for control of San Jose scale. The final conclusion was that trees treated for 8 consecutive years received no discernible injury, and treatments gave excellent control of the scale insects.
420. Snapp, Oliver I. 1930. Life history and habits of the plum curculio in the Georgia peach belt. U.S. Tech. Bull. 188, 91 pp. The life history and habits of the plum curculio in the Georgia peach belt during 1921-1924 are reported. The data are presented on a yearly basis and the bulletin is somewhat difficult to follow but is very useful to anyone interested in life cycle details of the plum curculio.
421. Snapp, Oliver I. 1930. Results of spraying and dusting experiments on large blocks of peach trees for the control of the curculio. J. Econ. Entomol. 23:699-704. Lead arsenate applied as a spray is shown to be more effective against the curculio than the same insecticide applied in a dust mixture. The petal-fall spray is also shown to be an important part of the spray schedule.
422. Snapp, Oliver I. 1931. 1931 spray and dust schedules for southern peaches. U.S. Bur. Entomol. Circ. E-270 (rev.). This paper contains insecticide and fungicide recommendations for control of peach diseases and insects in 1931.
423. Snapp, Oliver I. 1932. Lesser peach borer killed with paradichlorobenzene dissolved in cottonseed oil. U.S. Yearb. Agric., 1932, pp. 265-266. The use of paradichlorobenzene dissolved in cottonseed oil and brushed into lesser peachtree borer infested area is described. Only the infested areas are treated, and application can be made in the fall or summer.
424. Snapp, Oliver, I. 1933. Summary of results of experiments with paradichlorobenzene in crude cottonseed oil for the control of borers and other insects. U.S. Bur. Entomol. Plant Quar. Circ. E-302, 6 pp. This paper contains data from a number of scientists around the United States who tested paradichlorobenzene crude cottonseed oil as a control for the lesser peachtree borer. In general, the mixture proved to be very effective against the lesser peachtree borer and produced no injury whatever to the tree when the treatment was confined to the infested areas. Injury sometimes occurred, however, when whole limbs or the entire trunks were coated with the mixture. The mixture also provided 100 percent control of the fruit tree bark beetle, Scolytus rugulosus.
425. Snapp, Oliver I. 1934. Paradichlorobenzene-crude cottonseed oil emulsion for the control of the peach borer. U.S. Bur. Entomol. Plant Quar. Circ. E-328, 3 pp. An emulsion of crude cottonseed oil impregnated with paradichlorobenzene applied as a spray around the base of peach trees was found to be effective in the control of the peach borer in nursery stock and young orchard trees.
426. Snapp, Oliver I. 1936. Insects attacking the peach in the South and how to control them. U.S. Dep. Agric. Farmers' Bull. 1557, 47 pp. This bulletin is written for farmers and contains comprehensive information on the insects attacking peaches and how to control them. Included are the plum curculio, peach borer, San Jose scale, oriental fruit moth, shothole borer, the lesser peach borer, grasshopper, peach twig borer, corn earworm, terrapin scale, West Indian peach scale, and miscellaneous other minor pests.
427. Snapp, Oliver I. 1938. Ethylene dichloride emulsion for the control of the peach borer. U.S. Bur. Entomol. Plant Quar. Circ. E-424, 4 pp. Results of experiments conducted in Georgia, New York, and Illinois showed that ethylene



- dichloride emulsion has a number of advantages over paradichlorobenzene for the control of the peach borer. Ethylene dichloride emulsion is effective at low soil temperatures and can therefore be used late in the fall and early in the spring when it is too cold for paradichlorobenzene.
428. Snapp, Oliver I. 1938. Recent experiments with ethylene dichloride emulsion for peach borer control. *J. Econ. Entomol.* 31:725-727. Ethylene dichloride emulsion applied either by spraying or pouring is reported as superior to paradichlorobenzene as a control for the peachtree borer.
  429. Snapp, Oliver I. 1938. An improved and inexpensive oviposition cage for insectary use. *U.S. Bur. Entomol. Plant Quar. Circ.* ET-131, 2 pp. A screen-wire cage developed as an oviposition cage for the peachtree borer is described.
  430. Snapp, Oliver I. 1938. Ethylene dichloride emulsion used to control peach borer. *Ga. Peach Grow.* 1:3. This paper is not available from the National Agricultural Library.
  431. Snapp, Oliver I. 1939. Dichloroethyl ether for the control of the curculio attacking peaches. *J. Econ. Entomol.* 32:486-490. Dichloroethyl ether in water and applied to the soil is cited as toxic to plum curculio larvae and pupae. These results are cited as sufficient justification to warrant further investigation as a possible substitute for lead arsenate as a control for the curculio.
  432. Snapp, Oliver I. 1939. Further studies with ethylene dichloride emulsion for the control of the peach borer. *J. Econ. Entomol.* 32:683-685. Data are presented that show ethylene dichloride emulsion effective in the spring when soil temperatures are too low for the use of paradichlorobenzene. Data are also presented that show paradichlorobenzene should not be used on young trees.
  433. Snapp, Oliver I. 1939. A new preparation for the control of the peachtree borer-ethylene dichloride emulsion. *Ky. Fruit Notes* 1:5-7. This paper is a restatement of the data found in No. 427.
  434. Snapp, Oliver I. 1940. Further studies of the plum curculio in the Georgia peach belt. *J. Econ. Entomol.* 33:453-456. It was found that one-half to three-fourths of the females of the first generation deposited eggs during the year of emergence. Overwintering adults were found to travel from tree to tree even if there was fruit for food and oviposition, but after they became disseminated throughout the orchard, their travel appeared to be confined to but a few adjacent trees. Adults entered hibernation in midsummer within a month after peach harvest in debris along the edges of woods bordering peach orchards.
  435. Snapp, Oliver I. 1940. Plum curculio adults survive low temperatures in the South. (Note) *J. Econ. Entomol.* 33:950. Plum curculios were reported as surviving the cold winter of 1940 in numbers nearly equal to the usual.
  436. Snapp, Oliver I. 1941. Value of the petal-fall application of lead arsenate in controlling the plum curculio on peach in the South. *J. Econ. Entomol.* 34:418-419. The results of this experiment showed that there were almost three times as many curculios on trees that did not receive a petal-fall application of lead arsenate as on those that received the spray.
  437. Snapp, Oliver I. 1941. Effect of ethylene dichloride emulsion on peach trees. *U.S. Bur. Entomol. Plant Quar. Circ.* E-555, 2 pp. Tree damage during 1940 from the use of ethylene dichloride as a control is investigated and confirmed to have actually been caused by cold weather and improper use of the chemical.
  438. Snapp, Oliver I. 1942. Dichloroethyl ether for the control of the plum curculio on peach. *U.S. Bur. Entomol. Plant Quar. Circ.* E-559, 4 pp. Dichloroethyl ether is listed as a soil treatment for

- plum curculio larvae and pupae. Two applications are recommended for control, the first application after all the larvae have left the fallen peach drops and the second about 2 weeks later when none of the surviving insects would be in the pupal stage. Jarring in the spring is also recommended as a part of the control program when dichloroethyl ether is used as a replacement for lead arsenate.
439. Snapp, Oliver I. 1942. Method and equipment for conducting laboratory experiments with insecticides for the control of insects that pupate in the soil. U.S. Bur. Entomol. Plant Quar. Circ. ET-201, 4 pp. A box constructed for laboratory experiments with soil insecticides is described in detail.
440. Snapp, Oliver I. 1942. Further tests of dichloroethyl ether and of jarring to control plum curculio. J. Econ. Entomol. 35:514-516. Two applications of dichloroethyl ether on the soil under the spread of the trees, plus 12 jarrings, gave as good control of the plum curculio as the regular schedule of lead arsenate.
441. Snapp, Oliver I. 1943. Propylene dichloride for peachtree borer control. J. Econ. Entomol. 36:765-768. Experiments with propylene dichloride gave control equal to that of ethylene dichloride against the peachtree borer. Lower dosages of propylene dichloride were effective, but higher levels of tree damage were also experienced.
442. Snapp, Oliver I. 1945. Further experiments with dichloroethyl ether for plum curculio control. J. Econ. Entomol. 38:417-418. Additional experiments conducted in 1942-44 showed two applications of dichloroethyl ether applied on the soil as equally effective as the application of three lead arsenate sprays for plum curculio control.
443. Snapp, Oliver I. 1945. Propylene dichloride for peachtree borer control: second report. J. Econ. Entomol. 38:419-425. Additional data are presented that show propylene dichloride giving excellent control of the peachtree borer without tree damage.
444. Snapp, Oliver I. 1945. Controlling the peachtree borer with propylene dichloride emulsion. U.S. Bur. Entomol. Plant Quar. Circ. E-676, 3 pp. Propylene dichloride is recommended as a replacement for ethylene dichloride and paradichlorobenzene for the control of the peachtree borer. It gives excellent control without tree injury and is about the same price as the other materials.
445. Snapp, Oliver I. 1946. DDT to control bugs that cause deformed peaches. J. Econ. Entomol. 39:41-43. Tarnished plant bugs are reported from peach trees in Spartanburg County, S.C. from full bloom to petalfall. Preliminary data indicate that jarring would not control the pest, but DDT was promising as a control.
446. Snapp, Oliver I. 1947. Experiments in 1946 on the control of bugs that cause deformed peach. J. Econ. Entomol. 40:135-136. Two applications of DDT at petalfall and at shuck-off appeared to reduce the number of peaches injured by plant bugs from 40 percent to 6.2 percent. Sabadilla was ineffective, but BHC showed some promise as a control.
447. Snapp, Oliver I. 1947. Benzene hexachloride for control of plum curculio on peaches. J. Econ. Entomol. 3:382-385. BHC is shown as a promising pesticide for control of plum curculio. It is reported as more effective when used as a spray and to give an offtaste to fruit if used close to harvest.
448. Snapp, Oliver I. 1948. Control of sucking bugs that cause deformed peaches. J. Econ. Entomol. 41:555-557. DDT was reported to give good control of stinkbugs. It was most effective when applied at petalfall. DDT was somewhat more effective than BHC. The DDT applied with a fog machine was as



- effective as conventional sprayers for control.
449. Snapp, Oliver I. 1948. New insecticides for control of plum curculio on peach. *J. Econ. Entomol.* 41:569-574. This paper reports extensive tests with pesticides evaluated as controls for the plum curculio. Parathion was reported as the best material with some promise shown for toxaphene, chlordane, and hexaethyl tetraphosphate.
450. Snapp, Oliver I. 1949. New insecticides for plum curculio control--second report. *J. Econ. Entomol.* 42:7-11. Parathion is reported as giving the best control of the plum curculio with some mortality occurring 2 weeks after application. BHC was also effective when measured by the infestation in peach drops.
451. Snapp, Oliver I. 1950. DDT and some of the newer insecticides for control of peachtree borers. *J. Econ. Entomol.* 43:315-318. Experiments conducted during 1945 through 1949 using DDT, BHC, chlordane, toxaphene, mexoethyl, tetraphosphate, parathion, ryania, propylene dichloride, ethylene dichloride, and paradichlorobenzene as controls for the peachtree borer are reported.
452. Snapp, Oliver I. 1951. Pests of Georgia fruits. *Ga. Rev.* 5:220-226. This is a very general paper that discusses the life cycle, biology, damage, and control of the major pests of peaches. Included are the plum curculio, peachtree borer, San Jose scale, and oriental fruit moth.
453. Snapp, Oliver I. 1951. Plum curculio control with new organic insecticides. *J. Econ. Entomol.* 44:504-508. A series of insecticide tests conducted during 1949-50 for plum curculio are reported. Overall, parathion was the better material. [It is still the principal recommendation for curculio control 30 years later.]
454. Snapp, Oliver I. 1952. Plum curculio control on peach in 1951. *J. Econ. Entomol.* 45:249-251. In tests conducted in 1951 for control of the plum curculio, dieldrin in four applications placed first and parathion in five applications placed second among the materials tested.
455. Snapp, Oliver I. 1952. Injury to peach trees from propylene dichloride. *J. Econ. Entomol.* 45:890. Injury is reported to peach trees treated with propylene dichloride during 1950. No injuries occurred from the treatment with ethylene dichloride. As a result, the recommendation of propylene dichloride as a control was withdrawn.
456. Snapp, Oliver I. 1952. Benzene hexachloride and DDT sprays for peachtree borer control. (Note) *J. Econ. Entomol.* 45:547. Pesticide tests conducted in 1949 and 1950 with BHC and DDT for peachtree borer control are shown effective in reducing infestation.
457. Snapp, Oliver I. 1953. Aldrin and dieldrin as soil insecticides to control plum curculio. *J. Econ. Entomol.* 46:180. Dieldrin and aldrin applied in the soil were tested as controls for larvae and adults of the plum curculio. Aldrin was highly effective, and dieldrin was rated as giving fairly good control.
458. Snapp, Oliver I. 1953. Effect on the oriental fruit moth of materials used for plum curculio control. (Note) *J. Econ. Entomol.* 46:707. Parathion and EPN were the most effective of six insecticides tested as controls for the oriental fruit moth.
459. Snapp, Oliver I. 1954. Experiments on control of Georgia peach pests in 1953. *J. Econ. Entomol.* 47:909-912. Details of insecticide tests conducted in 1953 for control of the plum curculio, peachtree borer and lesser peachtree borer are given.
460. Snapp, Oliver I. 1954. Insects of the peach in the Eastern States. *U.S. Dep. Agric. Farmers' Bull.* 1861, 32 pp. This bulletin contains information on all the peach insects found in the Eastern

- United States. Included are the black pecan aphid, Forbes scale, green peach aphid, green stinkbug, leaffooted bugs, lesser peachtree borer, oriental fruit moth, peach twig borer, peachtree borer, plum curculio, rusty plum aphid, San Jose scale, shothole borer, southern green stink bug, stink bugs, tarnished plant bug, terrapin scale, twicestabbed ladybeetle, and white peach scale. Extensive data on biology, ecology, economic damage, and controls are given for the major pests.
461. Snapp, Oliver I. 1955. Peach insect investigations at Fort Valley, Ga., during 1954. J. Econ. Entomol. 48:734-736. Laboratory experiments with insecticides worked into the soil showed that 2-year-old applications of aldrin and dieldrin and 1-year-old applications of heptachlor were highly effective in preventing plum curculio larvae from developing into adults and emerging. In foliar tests, parathion; malathion; aldrin; dieldrin; alone and in split schedules with parathion; lead arsenate; EPN; heptachlor; and CS-728 all gave control of the curculio. Ethylene dichloride and trichlorobenzene emulsions gave excellent control of the peachtree borer. Parathion and EPN were the best materials for the lesser peachtree borer.
462. Snapp, Oliver I. 1957. Control of the plum curculio with soil insecticides. J. Econ. Entomol. 50:457-459. The results reported in these tests indicate that it may be possible to control the plum curculio in peach orchards with aldrin, dieldrin, and chlordane for up to 4 years.
463. Snapp, Oliver I. 1958. Trunk sprays for control of the peachtree borer. J. Econ. Entomol. 51:557-558. Trunk sprays of DDT, BHC, or parathion were highly effective against light infestations of borers but were undependable against moderate and heavy infestations. Ethylene dichloride was effective against all population levels.
464. Snapp, Oliver I. 1960. Plum curculio control experiments in 1955-58. J. Econ. Entomol. 53:335-337. When tested against adult curculio, Guthion and Sevin showed good residual effectiveness, and Trithion showed short residual effectiveness.
465. Snapp, Oliver I. 1960. Soil treatments in lieu of spraying for plum curculio control in peach orchards. J. Econ. Entomol. 53:439-441. Experiments were conducted in soil boxes that showed aldrin and dieldrin prevented emergence of adult plum curculio for eight seasons, and heptachlor dust prevented emergence for seven seasons.
466. Snapp, Oliver I. 1960. New control for curculio. Agric. Res. 8(12):15. Aldrin, dieldrin, and heptachlor are reported as good for curculio control in the soil.
467. Snapp, Oliver I. 1961. Treatment of peach nursery stock to prevent infestation by the peachtree borer. (Note) J. Econ. Entomol. 54:400. The insecticide DDT in four applications gave good control of the peachtree borer in nursery stocks.
468. Snapp, Oliver I. 1961. Frees young trees of peach borer. Agric. Res. 9(11):15. Data presented in this paper are also published in No. 467.
469. Snapp, Oliver I. 1962. Peachtree borer experiments in peach orchards. J. Econ. Entomol. 55:418-419. A series of insecticides, a nematode parasite, and Bacillus thuringiensis are evaluated as controls for the peachtree borer. Endrin and dieldrin gave good control.
470. Snapp, Oliver I. 1963. Insect pests of the peach east of the Rocky Mountains. U.S. Dep. Agric. Agric. Inf. Bull. 272, 32 pp. All of the major and minor insect pests of peaches in the East are discussed in detail, including the biology, ecology, types of damage, economic significance, and control.



- This is an excellent paper for the reader desiring an overview of the entomological problems facing the peach producer.
471. Snapp, Oliver I., and Alden, C. H. 1923. Further studies with paradichlorobenzene for peach borer control with special reference to its use on young peach trees. U.S. Dep. Agric. Bull. 1169, 19 pp. This paper reports extensive tests with paradichlorobenzene on trees younger than 6 years. Dosages of three-fourths of an ounce are recommended for 4-year-old or younger trees, while 1 ounce is recommended for all other ages. Spring treatments are reported as giving 72.4 percent control, while fall treatments provided 95 to 100 percent control.
472. Snapp, Oliver I., and Alden, C. H. 1923. A note on the life history of the San Jose scale (Aspidiotus perniciosus) in the South. J. Econ. Entomol. 16:395-396. All stages of the San Jose scale from the crawling young to the full-grown females are reported each month during the winter in the South. The conclusion is made that in the latitude of the Gulf States, the San Jose scale breeds almost continuously during a mild winter.
473. Snapp, Oliver I., and Alden, C. H. 1923. The effect of low temperature on the San Jose scale in Georgia. (Note) J. Econ. Entomol. 16:552. This paper discusses field mortality of the San Jose scale as a result of temperature. Low temperatures caused as much as a 26 percent increase in mortality.
474. Snapp, Oliver I., and Alden, C. H. 1924. Dusting and spraying peach trees after harvest for control of the plum curculio. U.S. Dep. Agric. Bull. 1205, 19 pp. Data are presented that show postharvest applications of arsenate-hydrated lime spray reduce overwintering curculio populations. The procedure is recommended only in years that curculios have been particularly severe.
475. Snapp, Oliver I., and Alden, C. H. 1928. Paradichlorobenzene experiments in the South for peach borer control. U.S. Dep. Agric. Tech. Bull. 58, 40 pp. Experiments with paratoluidine, paradichlorobenzene, orthodichlorobenzene, and calcium cyanide for control of the peach-tree borer are reported. Paradichlorobenzene was the best material tested and is recommended for use at the close of the oviposition period. A 3/4- to 1-ounce dosage of the crystals in a continuous band about 1½ inches wide and 1½ inches from the trunk and covered with a shovelful of soil is the best method of application. The ring of crystals should always be placed above the topmost borer gallery. The treatment should not be used on young trees because of injury.
476. Snapp, Oliver I.; Alden, C. H.; Roberts, John W.; and Dunegan, J. C. 1923. Curculio and brown rot control. Ga. State Board Entomol. Circ. 37, 8 pp. This circular is a report of progress during 1922 on the control of curculio and brown rot with arsenate and lime sulphur sprays.
477. Snapp, Oliver I.; Alden, C. H.; Roberts, John W.; Dunegan, J. C.; and Pressley, J. H. 1927. Experiments on the control of the plum curculio, brown rot and scab, attacking the peach in Georgia. U.S. Dep. Agric. Bull. 1482, 32 pp. The curculio is reported as sometimes having two generations in Georgia and is credited for the severe outbreak of 1920. An application of arsenate at 75 percent petal fall and 4 weeks prior to fruit harvest is reported as critical. Sprays are reported as more effective in controlling curculio, brown rot, and scab. Sulfur hydrated and self-baited lime sulfur are reported as brown rot and scab controls.
478. Snapp, Oliver I., and Cullinan, F. P. 1944. The effect on peach trees of ethylene dichloride used for control of the peachtree borer. J. Econ. Entomol. 37:47-51. No tree

- injury was reported from peach trees treated with ethylene dichloride using the recommended dosage and procedures. However damage did occur when the emulsions were used at twice the strength or were applied in direct contact with the trees.
479. Snapp, Oliver I., and Hollon, Julius P. 1943. An improved curculio jarring sheet. U.S. Bur. Entomol. Plant Quar. Circ. E-608, 3 pp. A new jarring sheet for the plum curculio is described that has the feature of an opening in the center with a canvas bag attached underneath to receive and hold curculio as they drop through.
480. Snapp, Oliver I., and Jones, Thomas J. 1945. Device for picking up peach drops. U.S. Bur. Entomol. Plant Quar. Circ. E-638, 3 pp. A device for picking up peach drops for control of the plum curculio is described and discussed.
481. Snapp, Oliver I., and Swingle, H. S. 1929. Life history of the oriental peach moth in Georgia. U.S. Dep. Agric. Tech. Bull. 152, 16 pp. The first appearance of the oriental peach moth in Georgia is reported from Valdosta in 1923. It is reported as a noneconomic pest because no suitable host structure is available for the last three generations of larvae, which occur after peach harvest. The first three generations are spent in the young peach twigs, which have usually become too hard to serve as a host site after mid-July. The insect overwinters as a larva and 12 percent of the fifth, 65 percent of the sixth, and 100 percent of the seventh generation enter diapause.
482. Snapp, Oliver I., and Thomson, J. R. 1931. The control of the lesser peach borer with paradichlorobenzene solutions. U.S. Dep. Agric. Circ. 172, 12 pp. The lesser peachtree borer is reported as a severe pest of peaches, particularly in old trees with mechanical injuries. It is reported from plums, cherries, black-knot fungus, juneberry, beach plum, and chestnut. Injury is caused by the destruction of the cambium and inner bark layers by the feeding of larvae. Paradichlorobenzene dissolved in crude cottonseed oil is recommended as a control. It should be applied to the infected area with a paintbrush. Control obtained in these tests was from 93.4 to 97.9 percent.
483. Snapp, Oliver I., and Thomson, J. R. 1931. A new curculio jarring sheet. J. Econ. Entomol. 24:1082-1083. This article describes a new sheet for jarring plum curculios from trees that is light, large, easily constructed, and inexpensive.
484. Snapp, Oliver I., and Thomson, J. R. 1932. A progress report on feeding tests and spraying and dusting experiments for the control of the plum curculio. J. Econ. Entomol. 25:811-815. Results of experiments testing various pesticides are reported. Arsenate is reported as the overall most effective curculio control.
485. Snapp, Oliver I., and Thomson, J. R. 1932. A second report on the oriental fruit moth infestation in the Georgia peach belt. J. Econ. Entomol. 25:726-727. A large number of peaches from three orchards in central Georgia ('Elberta' mainly) were cut open and inspected for oriental fruit moth larvae during 1931. The infestation was very light and verified the low economic significance assigned to the pest in Georgia.
486. Snapp, Oliver I., and Thomson, J. R. 1932. A second report on the efficiency of the air-blast type of sprayer. (Note) J. Econ. Entomol. 25:726. Experiments were conducted in 1931 where trees were sprayed with lead arsenate for insect control and sulfur and zinc sulfate for disease control using an air blast and conventional sprayers. The curculio infestation was so light that no data on the curculio were obtained, but fruit from the plot sprayed with the air-blast sprayer developed scab,



whereas no scab was found in the conventionally sprayed plot.

487. Snapp, Oliver I., and Thomson, J. R. 1934. A device for regulating the quantity of liquid used in spraying. *J. Econ. Entomol.* 27:832-834. An apparatus is described that will spray under pressure accurate quantities of pesticides.
488. Snapp, Oliver I., and Thomson, J. R. 1935. A new curculio jarring sheet. *U.S. Bur. Entomol. Plant Quar. Circ. E-355*, 3 pp. These data have been presented in No. 483.
489. Snapp, Oliver I., and Thomson, J. R. 1935. A device for regulating the quantity of spray. *U.S. Bur. Entomol. Plant Quar. Circ. ET-62*, 4 pp. These data have been presented in No. 487.
490. Snapp, Oliver I., and Thomson, J. R., Jr. 1937. Flight and movement of peach borer moths. (Note) *J. Econ. Entomol.* 30:215. Female moths, although strong fliers, are cited as having a tendency to remain close to the tree from which they emerge. They usually mate quickly and deposit eggs on the same or adjacent tree. Three hundred fifty-seven yards is the greatest distance a female moth was observed to fly in one day. The females definitely tend to fly in circles, and oviposition is not confined to trees but also occurs on grass, weeds, stumps, sticks, and soil. The males are swift fliers and have been attracted to females for distance of six-tenths of a mile.
491. Snapp, Oliver I., and Thomson, J. R., Jr. 1943. Experiments with oils and lime-sulfur for the control of the San Jose scale on peach trees in the South. *U.S. Dep. Agric. Tech. Bull.* 852, 12 pp. Blended oil is reported as effective as a straight-run oil for the control of the San Jose scale. Three-percent lubricating oil emulsion is also reported as more effective than lime-sulfur as a control.
492. Snapp, Oliver I., and Thomson, J. R. 1943. Life history and habits of the peachtree borer in the Southeastern States. *U.S. Dep. Agric. Tech. Bull.* 854, 24 pp. The research for this paper was conducted from 1930 to 1938 and all aspects of the life history, seasonal occurrence, biology, behavior, parasites, etc., are covered. It is a classic paper and should be read by anyone conducting research on the peach borer. No data on control are presented.
493. Snapp, Oliver I.; Turner, W. F.; and Roberts, John W. 1922. Controlling the curculio, brown rot and scab in the peach belt of Georgia. *U.S. Dep. Agric. Circ.* 216, 30 pp. The biology and economic importance of the plum curculio and the distribution of peach production in Georgia are given for 1920. Particular attention is given to biological control procedures such as the destruction of crops, burning adjacent woodlands, and cultivation. Spray schedules for the plum curculio, brown rot, and scab are also given.
494. Spalding, D. H.; Wells, J. M.; and Cole, R. J. 1977. Toxigenic fungi from decayed tissues of lychee fruits. (Abstr.) *Proc. Am. Soc. Phytopathol.* 4:127. Fungi isolated from decayed tissues of mature lychee fruits were cultured for 3 weeks at 20° C on medium of shredded wheat, yeast extract, and sucrose. Cultures were then extracted with chloroform, concentrated, transferred to corn oil, and bioassayed for toxicity to day-old cockerels by crop incubation. Extracts of 37 of 132 lychee fungi were toxic to cockerels within 5 days of dosing. Toxigenic fungi, in order of frequency of isolation were of the genera Fusarium (24.3 percent), Cladosporium (21.6 percent), Alternaria (16.2 percent), Aposphaeria (10.8 percent), Collectotrichum (10.8 percent), Curvularia (8.1 percent), Phomopsis (5.4 percent), and Helminthosporium (2.7 percent). Chemical isolation, purification,

- and analysis confirmed the identity of the Curvularia toxin as being a mixture of 97 percent cytochalasin B and 3 percent cytochalasin A.
495. Spann, G. W.; Payne, J. A.; and Kirkpatrick, H. C. 1973. Infrared photography of peach short life sites in Georgia. Proc. Bienn. Workshop Color Aerial Photog. Plant Sci. Relat. Fields, 4th, pp. 29-42. In efforts to study peach-tree short life, flights were made over 11 orchards at altitudes of 1,500-12,000 ft with multispectral black-and-white and color infrared sensing system. Ground truth data was gathered at the same time the photographs were made. These data were processed through a GE Image 100 System, and preliminary data indicates that this system may provide a useful tool for studying peachtree short life.
  496. Sparks, D., and Payne, J. A. 1976. Bud break in pecan following boron toxicity. HortScience 11:494. This paper has also been published in No. 498.
  497. Sparks, D., and Payne, J. A. 1977. Freeze injury susceptibility of non-juvenile trunks in pecan. HortScience 12:497-498. Pecan trees with juvenile seedling trunks were strikingly less susceptible to freeze injury than trees with nonjuvenile trunks.
  498. Sparks, D., and Payne, J. A. 1977. Advancement of bud break in pecan following boron toxicity. Pecan South 4:136-137. Various rates of boron are shown to induce early bud break in pecans. Observations suggest that in order for injury to induce early bud break as occurred with the boron treatments, it must occur during the preceding growing season or during the previous fall.
  499. Sparks, D., and Payne, J. A. 1977. Trunk type and winter injury of pecan. Pecan South 4:256-257. Data are reported from a nursery and orchard in Waycross, Ga. that show little or no freeze damage to trees on seedling trunks, while high levels of damage occurred on trees with variety trunks.
  500. Sparks, D., and Payne, J. A. 1977. Freeze injury in pecans. Annu. Rep. North. Nut Grow. Assoc. 68:113-127. This paper contains the same data presented in No 501.
  501. Sparks, D., and Payne, J. A. 1978. Winter injury in pecans--a review. Pecan South 5:56-60, 82-88. An excellent review of winter injury to pecans. The authors cite important factors as (1) dormancy, (2) insect and disease control, (3) air drainage, (4) varieties, (5) tree health, (6) tree size, and (7) seedling vs. variety trunk.
  502. Sparks, D., and Payne, J. A. 1978. Nutrient concentration differences in Stuart vs. Desirable pecan leaves. Pecan South 5:158-159. Leaf analysis data are presented for 'Stuart' and 'Desirable' varieties that show 'Desirable' with higher concentration of K, Ca, Mg, Mn, B, Cu, and Zn and lower levels of N and Fe. These data strengthen the suggestion that varieties should be planted in separate blocks and that leaflets for nutrient analysis should be collected and analyzed by variety.
  503. Sparks, D.; Payne, J. A.; and Horton, B. D. 1976. Effects of subfreezing temperatures on bud break of pecan. HortScience 11:415-416. This paper contains the same data presented in No. 304.
  504. Sparks, D.; Payne, J. A.; and Horton, B. D. 1977. Early bud break in pecan following sub-freezing temperatures. Pecan South 4:72-73. Experiments on reported 1-year-old 'Desirable' and 'Stuart' whips on 3-year-old seedling root-stocks. Temperature chambers were placed over the trees and they were exposed to 16 hours of 25°, 19°, 14°, or 9° F. Tests were conducted in December, and the trees had already received four natural frosts. The only symptoms of winter injury from these treatments was a slight discoloration of the green inner bark, but



- no effect was recorded on bud break, survival, or scolytid beetle attack. 'Desirable' did receive slightly more winter injury.
505. Sparks, D.; Payne, J. A.; and Jones, L. S. 1974. Association of Prionus root borers with nutrition, growth and yield of pecan, Carya illinoensis Koch. HortScience 9:197-199. Comparisons of normal trees and those declining because of Prionus beetles showed that leaflet weight, shoot length, and yield were reduced in the declining trees. Also, the declining trees showed alternate bearing to a greater degree. Potassium and calcium concentrations in leaflets from declining trees were lower than in those from normal trees.
506. Sparks, D.; Payne, J. A.; and Jones, L. S. 1974. Root borers become problems, need attention. Pecan Q. 8:18-20. This paper was also published in Nos. 308 and 505.
507. Springer, J. P.; Clardy, J.; Wells, J. M.; and Cole, R. J. 1975. The structure of paxilline, a tremorgenic metabolite of Penicillium paxilli Bainier. Tetrahedron Lett. 30:2531-2534. The structure of paxilline, a tremorgenic metabolite of Penicillium paxilli is reported.
508. Springer, J. P.; Clardy, J.; Wells, J. M.; Cole, R. J.; and Kirksey, J. W. 1976. Isolation and structure determination of the mycotoxin Chaetoglobosin C, a new [13] cytochalasin. Tetrahedron Lett. 17:1355-1358. The isolation and structure of chaetoglobosin C is given. The isolates were taken from the fungus Penicillium aurantio-virens, which was originally found on pecan weevil infested pecans.
509. Stoetzel, M. B., and Tedders, W. L. 1981. Investigation of two species of Phylloxera on pecan in Georgia. J. Ga. Entomol. Soc. 16:144-150. Two phylloxerans were found on pecan leaves in Georgia. Phylloxera notabilis Pergande was first reported on pecan in Georgia in 1905. A recently described species, Phylloxera russellae Stoetzel, was first identified from galls on pecan leaves in 1980. It is now known that this species has been present in Georgia for many years. A discussion of the biological development of both species in Georgia is given. Information on the distribution, increase, and spread of P. russellae on several pecan cultivars in Georgia is also included.
510. Swingle, H. S., and Snapp, Oliver I. 1931. Petroleum oils and oil emulsions as insecticides, and their use against the San Jose scale on peach trees in the South. U.S. Dep. Agric. Tech. Bull. 188, 48 pp. This bulletin discusses crude petroleum oils with regard to their origin, principle constituents, and chemical and physical properties. The average percentages of control of the San Jose scale given by oil sprays over a 4-year period were as follows: a 1 percent spray gave 91.0 percent control, 1.5 percent gave 97.9 percent, 2 percent gave 96.1 percent and 3 percent gave 99.1 percent control.
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511. Takacs, D. J.; Payne, J. A.; Tedders, W. L.; Wehunt, E. J.; and Horton, B. D. 1970. Clitocybe root rot of pecans. Plant Dis. Rep. 54:620-621. Data obtained in this paper are presented in greater detail by Weaver and Payne in No. 600.
512. Tedders, W. L. 1965. The biology and effect of two Miridae on pecan nut drop in southwest Georgia. Proc. Southeast. Pecan Grow. Assoc. 58:34-36. Three species of plant bugs in the family Miridae are cited as sometimes numerous on the blooms and small nuts of pecans. Some growers have attributed nut loss to these insects, but this paper provides data showing that control is unnecessary. A brief biology of two of the species, Orthotylus ramus

- and Plagiognathus repletus, is given.
513. Tedders, W. L. 1974. Bands detect weevils. Pecan Q. 8:24-25. A new type of tree band is described for the detection of pecan weevils moving up the tree trunk. Sufficient weevils were captured to detect first emergence as well as determine the seasonal emergence pattern.
514. Tedders, W. L. 1976. Pesticides for pecan pests. Proc. Southeast. Pecan Grow. Assoc. 69:99-103. Five insecticides were evaluated as controls for the aphid complex, the mite Eotetranychus hicoriae, and the pecan weevil.
515. Tedders, W. L. 1976. Pesticides for pecan pests. Pecan South 3:376-379. This is a popular publication of the data contained in No. 514.
516. Tedders, W. L. 1976. Beneficial insects of pecan. Pecan South 3:400-402. A popular publication with 24 photographs and general biologies of the major predator species of pecan insects.
517. Tedders, W. L. 1976. A method of determining the presence of pecan weevils with burlap bands. Pecan South 3:422-423. This paper is the same as that found in No. 513.
518. Tedders, W. L. 1977. Preliminary evaluation of the insect growth regulator diflubenzuron against pecan pests. J. Ga. Entomol. Soc. 12:243-247. In these tests, diflubenzuron applied as a spray to pecan seedlings failed to control the blackmargined aphid and the spider mite Eotetranychus hicoriae (McGregor). However, when it was applied to pecan trees in cages, it was effective in controlling the pecan weevil by reducing egg hatch. Diflubenzuron was also cited as stimulating excessive nut puncturing by adult weevils.
519. Tedders, W. L. 1977. Trioxys pallidus and Trioxys complanatus as parasites of Monellia costalis, Monelliopsis nigropunctata and Tinocallis caryaefoliae. Ann. Entomol. Soc. Am. 70:687-690. The braconid wasps, Trioxys pallidus and Trioxys complanatus, parasitize all three members of the aphid complex under laboratory conditions. However, both species showed a strong preference for Monellia costalis. Both parasite species were released at the Byron location, but no specimens were ever recovered, a strong indication that they did not become established.
520. Tedders, W. L. 1978. Important biological and morphological characteristics of the foliar feeding aphids of pecan. U.S. Dep. Agric. Tech. Bull. 1579, 29 pp. This technical bulletin is the most comprehensive single publication on the various species of aphids attacking pecans and includes details on the most important predator species. The species found on pecan, the general seasonal abundance, physical development and reproduction, feeding locations, and gross physical damage caused by feeding are included in the study.
521. Tedders, W. L. 1981. Report of the spread of an undescribed species of Phylloxera among mature pecan cultivars in Georgia. Proc. Southeast. Pecan Grow. Assoc. 74:73-76. An undescribed species of Phylloxera was found in 1975 on mature 'Schley' and 'Stuart' pecan cultivars in central and south Georgia. The species is presumed to be the same one that has infested mature 'Pabst' cultivars for many years and was generally believed to be Phylloxera notabilis Pergande, a common pest of nursery pecans and young seedlings. In central Georgia each year since 1975, infestations of the undescribed species on 'Schley' and 'Stuarts' have increased in numbers. A survey of mature 'Schley', 'Stuart', and other cultivars from across the State indicate that the undescribed species is now found in all of the pecan-growing areas of the State. The life history of the species is described.



522. Tedders, W. L. 1981. In vitro inhibition of the entomopathogenic fungi Beauveria bassiana and Metarhizium anisopliae by six fungicides used in pecan culture. Misc. Publ. Entomol. Soc. Am. 12:346-349. Six fungicides used in pecan culture were evaluated in vitro against the entomopathogenic fungi B. bassiana and M. anisopliae both of which attack the pecan weevil. Triphenyltin hydroxide was the most toxic fungicide to both pathogens, followed by benomyl, zineb, and dodine. Sulfur and dinocap were the least toxic.
523. Tedders, W. L., and Angalet, G. W. 1981. Colonization of Coccinella septempunctata (L.) in Georgia. J. Ga. Entomol. Soc. 16:47-53. Large numbers of the coccinellid Coccinella septempunctata were field-collected in New Jersey and released in four counties in Georgia for control of Monellia caryella, Monelliopsis nigropunctata, and the black pecan aphid on pecan. Colonization was successful in two of the four counties and seemed to be directly related to the abundance of pea aphids and cowpea aphids on vetch at release sites. Limited feeding by C. septempunctata on the aphids was observed.
524. Tedders, W. L., and Calcote, Vernon R. 1967. Male and female reproductive systems of Laspeyresia caryana, the hickory shuckworm moth (Lepidoptera:Olethreutidae). Ann. Entomol. Soc. Am. 60:280-282. The reproductive morphology of male and female hickory shuckworm adults is presented. The systems are generally typical of those found within Lepidoptera.
525. Tedders, W. L.; Calcote, Vernon R.; and Payne, Jerry A. 1970. A method for rapid germination of pecan seed. Pecan Q. 4:11. Pecan seeds taken directly from trees about 2 weeks before they were ready to fall and placed in moist vermiculite and stratified did not go into dormancy and sprouted uniformly within 13 days.
526. Tedders, W. L.; Calcote, V. R.; and Payne, J. A. 1970. A method for rapid germination of pecan seed for use in rearing pecan insects. Proc. Tex. Pecan Grow. Assoc. 49:48. This paper presents the same data published in No. 525.
527. Tedders, W. L., and Edwards, G. 1970. Equipment for collecting, anesthetizing and sexing large numbers of hickory shuckworm moths, Laspeyresia caryana (Lepidoptera:Olethreutidae). J. Ga. Entomol. Soc. 5:13-18. Procedures are presented and equipment devised so that large numbers of larvae of the hickory shuckworm can be collected and stored until needed for various experiments.
528. Tedders, W. L., and Edwards, George. 1970. Activity of hickory shuckworm from collections in traps. J. Econ. Entomol. 63:1610-1611. The nocturnal activity pattern of adult hickory shuckworm as indicated by hourly collections in blacklight traps is presented. Activity was greatest in the first hour after sunset and then gradually diminished throughout the night.
529. Tedders, W. L., and Edwards, George. 1972. Effects of blacklight trap design and placement on catch of adult hickory shuckworms. J. Econ. Entomol. 65:1624-1627. Seventeen comparisons of blacklight traps were made to determine the effects of trap components, ultraviolet output, killing agents, and trap placement on captures of hickory shuckworm moths and on the total weight of all insects caught. Placement of traps close to the fruiting area of a pecan tree was found to be the most important consideration, but catches of the shuckworm were also increased by the total output of ultraviolet radiation. Baffles on the trap did not aid in the catch of shuckworms. The closeness of the lamp to the collecting funnel appeared to be important, but an increase in the funnel diameter was of minor importance.

530. Tedders, W. L., and Edwards, G. W. 1974. A blacklight trap for surveys of hickory shuckworm moth. J. Ga. Entomol. Soc. 9:176-181. A small 6-W blacklight trap suitable for use in detecting hickory shuckworm population is described.
531. Tedders, W. L., and Ellis, H C. 1977. Aerial application of Bacillus thuringiensis var. kurstaki (HD-1) to shade and ornamental pecan trees against Hyphantria cunea and Datana integerrima. J. Ga. Entomol. Soc. 12:248-250. Two applications of a commercial formulation of B. thuringiensis were shown effective in controlling the fall webworms and walnut caterpillars.
532. Tedders, W. L., and Gentry, C. R. 1970. Know these pecan enemies--hickory shuckworm and pecan weevil. Prog. Farmer., August, 1970, p. 26. This is popular publication with no new data.
533. Tedders, W. L.; Hartsock, J. G.; and Osburn, Max. 1972. Suppression of hickory shuckworm in a pecan orchard with blacklight traps. J. Econ. Entomol. 65:148-155. A 3-year study was conducted to determine whether the hickory shuckworm could be suppressed by using one blacklight trap per four trees in an 8-acre pecan orchard. At the end of the 3-year period, suppression to a degree equal to that provided by three applications of broad spectrum insecticides was achieved.
534. Tedders, W. L., and Osburn, Max. 1966. Blacklight traps for timing insecticide control of pecan insects. Proc. Southeast. Pecan Grow. Assoc. 59:102-106. The possibility of control of the hickory shuckworm, pecan nut casebearer, and the pecan leaf casebearer with blacklight traps is discussed. Also, the season population trends around Albany, Ga. for all three species is graphically presented.
535. Tedders, W. L., and Osburn, Max. 1967. Separating males and females of the hickory shuckworm, Laspeyresia caryana (Lepidoptera:Olethreutidae), by sexual characters. Ann. Entomol. Soc. Am. 60:282-283. A series of ways are presented for identifying male and female hickory shuckworms in the pupal as well as in the adult stage.
536. Tedders, W. L., and Osburn, Max. 1967. Examining blacklight trap collections for small pecan insects. J. Ga. Entomol. Soc. 2:87-89. The difficulties of examining catches of small pecan insects from blacklight traps are lessened by using a series of sieves in the trap and at the laboratory to reduce the volume of insects. Also, a separator is described that reduces the volume still further.
537. Tedders, W. L., and Osburn, Max. 1968. Preliminary experiments with ultra low volume aerial sprays for control of pecan insects. Proc. Southeast. Pecan Grow. Assoc. 61:175-177. Five applications of Guthion were applied to pecan trees either as a dilute spray with ground equipment or by airplane as an ultra low volume treatment. Neither method gave adequate control of the blackmargined aphid, but both gave excellent control of the black pecan aphid and the hickory shuckworm. Nuts from treated trees were also considerably heavier than nuts from unsprayed trees.
538. Tedders, W. L., and Osburn, Max. 1970. Notes on biology and control of the pecan weevil. (Abstr.) Proc. Southeast. Pecan Grow. Assoc. 63:35. The same data are presented in No. 541.
539. Tedders, W. L., and Osburn, Max. 1970. Tests with aldicarb disulfoton and phorate for aphid control on pecans. J. Ga. Entomol. Soc. 5:58-60. Aldicarb, disulfoton, and phorate were evaluated as systemic insecticides for control of Monellia spp. attacking pecans. Aldicarb gave significant control but results with disulfoton and phorate were inconsistent and below those obtained with aldicarb.



540. Tedders, W. L., and Osburn, Max. 1970. Morphology of the reproductive systems of Gretchena bolliana, the pecan bud moth. Ann. Entomol. Soc. Am. 63:786-789. The morphology of the reproductive system of male and female pecan bud moths is given. The systems are very typical of those found in Lepidoptera.
541. Tedders, W. L., and Osburn, Max. 1971. Emergence and control of the pecan weevil. J. Econ. Entomol. 64:743-744. Known numbers of pecan weevil larvae were placed in cages containing soil treated with dieldrin. Weevils later emerged as adults but had shortened life. Additional tests with caged weevils in cultivated and unbroken soil showed that condition of soil did not cause any significant difference in total adult emergence. Maximum emergence occurred in late August and early September.
542. Tedders, W. L., and Smith, J. S., Jr. 1973. Apparent shading effect on pecans by sooty mold growth. Proc. Southeast. Pecan Grow. Assoc. 66:137. These data are also published in No. 543.
- 543a. Tedders, W. L., and Smith, John S. 1976. Shading effect on pecan by sooty mold growth. J. Econ. Entomol. 69:551-553. Sooty mold fungus growing on the honeydew of two species of aphids feeding on pecans was shown to reduce light transmission through the leaves by as much as 25 percent. The conclusion was made that sooty mold probably has a serious effect on yield. Sooty mold was also found to adhere better to 'Stuart' leaves than to 'Schley' leaves.
- 543b. Tedders, W. L.; Smith, J. S.; and White, A. W. 1981. Experiment to determine the effects of feeding by Monellia caryella (Fitch) and of simulated honeydew on pecan seedlings in the greenhouse. J. Ga. Entomol. 16:515-517. Foliar feeding by blackmargined aphid has severe detrimental effects on the growth of pecan seedlings. Seedling stem length and diameter as well as the root system were greatly reduced by aphid feeding, while the number of deformed leaves increased considerably when compared to an aphid free check. A simulated honeydew treatment produced a similar but less severe effect.
544. Tedders, W. L., and Thompson J. M. 1981. Histological investigation of stylet penetration and feeding damage to pecan foliage by three aphids (Hemiptera (Homoptera): Aphididae). Misc. Publ. Entomol. Soc. Am. 12:69-83. Detailed information is given on the histology and feeding behavior of the three important aphid species that attack pecan. This is the most comprehensive research that has been reported on the feeding and damage caused by these pests.
545. Tedders, W. L.; Weaver, D. J.; and Wehunt, E. J. 1973. Pecan weevil: suppression of larvae with the fungi Metarrhizium anisopliae and Beauveria bassiana and the nematode Neoaplectana dutkyi. J. Econ. Entomol. 63:723-725. Two fungus diseases and one parasitic nematode were evaluated in the field and laboratory as controls for the larvae of the pecan weevil. Selected treatments with all three gave significantly increased mortality of larvae to the level that additional studies on formulation and methods of application are warranted.
546. Tedders, W. L.; Yonce, C. E.; and Gentry, C. R. 1981. Feeding by European corn borer on peach trees. J. Ca. Entomol. Soc. 16:64-67. A large population of the European corn borer developed on brown-top millet that was interplanted among trees in a young peach orchard. In September, partially developed larvae migrated from the millet and weeds to the peach trees, where they continued feeding and damaged 90 percent of the peach tree limbs. This is a new host record for the European corn borer.
547. Thompson, J. M. 1968. Apple varieties for testing in Georgia.

- I. Mollie's Delicious. The Harvester 4:13. The apple variety 'Mollie's Delicious' is reported as suitable for home orchardists all over the State of Georgia.
548. Thompson, J. M. 1968. Apple varieties for testing in Georgia. II. Quinte. The Harvester 4:11-12. An evaluation of the apple variety 'Quinte' in Georgia is given.
549. Thompson, J. M. 1969. Observations of fireblight on various apple variety rootstock combinations. (Abstr.) Proc. Assoc. South. Agric. Work. 66:199. Fireblight and blossom blight are reported from a USDA planting of apples located in Byron, Ga.
550. Thompson, J. M. 1970. Apples for Georgia. Proc. Ga. Hortic. Soc. Annu. Meet. 6:27-29. A list of the better apples to grow in Georgia is given and discussed. Included are 'Red Delicious', 'Golden Delicious', 'Dorsett Golden', 'Winesap', 'Jonathan', 'Jonadel', 'Red St. Lawrence', 'Shockley', 'Ben Davis', 'Terry Winter', 'Yates', 'Rome Beauty', 'Yellow Transparent', 'Quinte', 'Red Delight' and 'Mollie's Delicious'.
551. Thompson, J. M. 1971. Effect of rootstock on fireblight in several apple cultivars. HortScience 6:167. Under conditions of natural infection in the third year of planting, fireblight disease was less severe on seedling roots than on EM VII, MM 104 and MM 106. The most susceptible cultivars appeared to be 'Tydeman's Red' and 'Raritan'. 'Williams Red' was the only cultivar that escaped fireblight entirely.
552. Thompson, J. M. 1972. Fireblight ratings, bloom dates, and precocity of apple varieties tested in the Southeast. Fruit Var. Hortic. Digest 26:84-97. This paper provides an extensive list of cultivars evaluated in the Southeast for fireblight susceptibility, bloom dates compared to 'Red Delicious', and precocity of tested cultivars.
553. Thompson, J. M. 1972. Apple varieties for testing in Georgia.
- IV. Jersey mac. The Harvester 7:10-11. An evaluation of the apple cultivar 'Jersey mac' for production in Georgia is given.
554. Thompson, J. M. 1975. The technique of budwood grafting. Fruit Var. J. 29:58-61. A method of budwood grafting is described for pears after the June budding period has passed.
555. Thompson, J. M. 1976. Inheritance of fireblight susceptibility in pear (*Pyrus communis* L.). (Abstr.) Fruit Var. J. 30:9. This paper reports widespread distribution in high-quality dessert pears of a gene, Se, that causes sensitivity (usually mortal susceptibility) to fireblight.
556. Thompson, J. M. 1976. Late blooming apples. (Abstr.). Fruit Var. J. 30:12. At Blairsville, Ga., a sampling of approximately 500 cultivars of *Malus sylvestris* Mill. showed bloom date variability of at least a month. The earliest, 'Carolina Hopkins', bloomed 7 days before the standard variety, 'Red Delicious'; whereas the latest, 'Spatblubender', bloomed 24 days after the standard.
557. Thompson, J. M. 1978. Cold hardy citrus. In Feasibility of Introducing Food Crops Better Adapted to Environmental Stress, Vol. 2, pp. 41-43, National Science Foundation, NSF/RA-780289. An evaluation of the trifoliate orange as a horticultural crop is given.
558. Thompson, J. M. 1978. Don't let grafts dry out! The Harvester 13:26-29. Procedures for wrapping and protecting the scion after grafting are given.
559. Thompson, J. M. 1981. The plum industry in the Southeastern U.S. Fruit Var. J. 35:53-54. The plum growing industry in the Southeastern United States is discussed along with the important varieties of the area.
560. Thompson, J. M.; Collins, Major; and Payne, J. A. 1977. Four dooryard apples for the Coastal Plain. Fruit South 2:18-20. Four cultivars that are candidates for dooryard planting are listed and



- discussed. They are: 'Hollin', 'Gibbs A', 'Prince' and 'Marchant'. 'Hollin' was found growing in the Atlanta area, while the other three were found in the Tifton, Ga. area. Complete details of each cultivar are given.
561. Thompson, J. M.; Collins, M.; and Payne, J. A. 1977. Apples for testing in Georgia: V. 'Hollin', 'Gibbs A', 'Prince', and 'Marchant'. The Harvester 12:14-22. These data have also been presented in No. 560.
- 562a. Thompson, J. M., and Prince, V. E. 1981. 'Explorer' plum. HortScience 16:797. 'Explorer' plum is released to provide a large, July-maturing, amber-fleshed, purple plum adapted to Japanese-type plum-growing areas of the Southeastern United States.
- 562b. Thompson, J. M., and Prince, V. E. 1981. Explorer-A new full-season Japanese-type plum for the Southeastern United States. Fruit Var. J. 35:104-106. Data are presented for the new plum release 'Explorer'.
563. Thompson, J. M., and Taylor, Jack. 1971. Genetic susceptibility to Glomerella leaf blotch in apple. J. Hered. 62:303-306. It was shown that the dominant gene Gb, shown to be heterozygous in the 'Golden Delicious' apple variety, permits susceptibility to leaf blotch. Tested cultivars were found to be homozygous recessive at this locus and therefore resistant.
564. Thompson, J. M.; Zimmerman, R. H.; and Zwet, T. van der. 1975. Inheritance of fireblight resistance in Pyrus. I. A dominant gene, Se, causing sensitivity. J. Hered. 66:259-264. Evidence for the existence of a dominant gene in pear for susceptibility to fireblight is presented. The gene was named Se and resulted in high susceptibility of trees leading to sudden collapse and often death. The authors question the existence of the dominant genes Ew<sub>1</sub> and Ew<sub>2</sub>. This work shows that breeders do not need to go outside P. communis germplasm to get satisfactory fireblight resistance.
565. Thompson, J. M.; Zwet, T. van der; Draper, A. D.; and Blake, R. C. 1976. Evidence of cytoplasmic and genetic male sterility in pears. J. Hered. 67:339-346. Male sterility exists in pears with one common phenotype of small cup-shaped, male-sterile flowers and a less common phenotype in which the male is expressed in otherwise normal-appearing flowers. Evidence is shown for cytoplasmic male sterility that can be overcome by the action of two dominant restorer genes with duplicate recessive epistasis.
566. Thompson, J. M.; Zwet, T. van der; and Oitto, W. A. 1974. Inheritance of grit content in fruits of Pyrus communis L. J. Am. Soc. Hortic. Sci. 99:141-143. Eighty-six cultivars and selections were rated for their grit content. Of these, 64 percent were rated six or above which is considered commercially acceptable. More than 2,000 seedlings were grouped based on their mean parental grit rating, and it was shown that the percentage of seedlings from a progeny with commercially acceptable grit ratings could be predicted. Grit cell development appears to be inherited quantitatively at a minimum of four loci. The genes appear to be additives in action rather than dominant.
567. Tumlinson, J. H.; Yonce, C. E.; Doolittle, R. E.; Heath, R. R.; Gentry, C. R.; and Mitchell, E. R. 1974. Sex pheromones and reproductive isolation of the lesser peachtree borer and the peachtree borer. Science 185:614-616. (E,Z)-3,13-octadecadien-1-ol acetate and (Z,Z)-3,13-octadecadien-1-ol acetate isolated from the female lesser peachtree borer and the female peachtree borer, respectively, strongly attract the respective males of these species in field bioassays. These compounds are the largest pheromones isolated thus far from a lepidopterous species.
568. Turner, William F. 1916. Pecan insects. Proc. Natl. Nut Grow.

- Assoc. 15:23-26. This paper contains a general assessment of the insect situation around Thomasville, Ga., in 1916 and a question-and-answer session with producers. Several types of "borers" and "casebearers" are discussed.
569. Turner, William F. 1933. Progress in phony peach disease eradication. J. Econ. Entomol. 26:659-667. The phony peach disease is known to occur in 12 Southern States and in Illinois. It is generally present and severe in Georgia and south Alabama; during the last few years more than a million trees have been either pulled or abandoned, and many growers have been forced out of production. Individual cases are widely scattered throughout all of the other Gulf States, but its results in these areas are not yet commercially destructive; very few infections have been found in the remaining States, namely Oklahoma, Arkansas, Missouri, Tennessee, South Carolina, North Carolina, and Illinois. An eradication campaign was begun in 1929 by the USDA in cooperation with the State of Georgia, which at that time was the only State in which phony disease had been recognized.
570. Turner, William F. 1946. Distribution of plum feeding species of Macropsis. J. Econ. Entomol. 39:394-395. A survey was made to determine the southern limits of the distribution of M. trimaculata and other members of the genus. In general, a wider range for the genus was demonstrated than was generally credited to these species, but the surveys still suggested a northern distribution.
571. Turner, William F. 1949. Insect vectors of phony peach disease. Science 109:87-88. In a search to find the vectors of phony disease, surveys suggested that the disease was being vectored by stem-feeding Cicadellidae belonging to the subfamily Tettigellinae. The principal species implicated were Homalodisca triquetra, Graphocephala versuta, Cuerna costalis, and Oncometopia undata.
572. Turner, William F. 1952. The role of insect surveys in virus-vector research. Plant Dis. Rep. Suppl. 211, pp. 47-50. Four species of Cicadellidae, Homalodisca triquetra, Oncometopia undata, Cuerna costalis, and Graphocephala versuta have been proved able to transmit phony disease under experimental conditions. It has been demonstrated that two of them, H. triquetra and O. undata, are natural vectors; the role of the other two is still in doubt. H. triquetra is a strictly southern species, while O. undata ranges much farther north.
573. Turner, William F., and Pollard, Herschel N. 1955. Additional leafhopper vectors of phony peach. J. Econ. Entomol. 48:771-772. This paper reports two additional species as transmitting phony disease, Draeculacephala portola or balli (correct identity unknown) and Homalodisca isolita. Draeculacephala sp. is not an efficient vector, while H. insolita appears to be as efficient an experimental vector of phony peach as any of the previously incriminated species.
574. Turner, William F., and Pollard, Herschel N. 1959. Insect transmission of phony peach disease. U.S. Dep. Agric. Tech. Bull. 1193, 27 pp. This is an excellent scientific paper demonstrating that five species of leafhoppers were capable of transmitting phony peach under experimental conditions. The disease was considered a virus and was cited with a latent period in the insect of at least 8 days. The primary natural vectors were cited as Homalodisca coagulata and Oncometopia undata.
575. Turner, William F., and Pollard, Herschel N. 1959. Life histories and behavior of five insect vectors of phony peach disease. U.S. Dep. Agric. Tech. Bull. 1188, 28 pp. Five leafhoppers of the subfamily Tettigellinae have been



incriminated as vectors of phony peach. These are Homalodisca coagulata, Oncometopia undata, Graphocephala versuta, Cuerna costalis, and Homalodisca insolita.

The first two species are primary natural vectors. The species H. coagulata, O. undata, G. versuta, and H. insolita hibernate in the woods; C. costalis overwinters under matted grasses in open fields and in orchards. Only H. coagulata and O. undata include peach among their favorite host plants. Biological data for all five species are also given.

576. Turner, William F.; Snapp, Oliver I.; Alden, C. H.; Roberts, J. W.; and Dunegan, J. C. 1923. Curculio and brown rot control. Ga. State Board Entomol. Circ. 37, 9 pp. This circular is a report of progress during 1922 on the control of curculio and brown rot with arsenate and lime sulfur sprays.

577. Turner, William F.; Spooner, C. S.; and Crittenden, C. G. 1918. Pecan insects, pecan scab, pecan diseases other than scab. Ga. State Board Entomol. Bull. 49: 6-37. This is one of the earliest bulletins written from a farmer's standpoint about the diseases and insect pests of pecans. Controls of the time are also included.

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578. Walker, Fred W. 1932. Control of the black hickory aphid. Proc. Ga.-Fla. Pecan Grow. Assoc. 26:39-43. This paper provides a brief discussion of the biology and life cycle of the black pecan aphid and also reports nicotine sulfate as a control.
579. Walker, Fred W. 1933. Experiments with dormant sprays for control of leaf and nut casebearers. Proc. Ga.-Fla. Pecan Grow. Assoc. 27:31-35. This research was conducted before disease controls had been developed for the nut casebearer and the authors cited dormant sprays applied at the

proper time as providing good control of the insect.

580. Walker, Fred W. 1933. The red spider on pecan and how to control it. Proc. Natl. Pecan Assoc. 32:16-21. This paper discusses the life cycle of the spider mite on pecan in detail. Its control by the use of a sticky barrier around the trunk is also covered along with control by nicotine sulfate or lime-sulfur sprays.
581. Walker, Fred W. 1933. Results of experiments with dormant sprays for control of the nut casebearer. Proc. Natl. Pecan Assoc. 32:12-14. Dormant sprays are shown under laboratory conditions to promote control of the pecan nut casebearer.
582. Weaver, D. J. 1971. Association of two Cylindrocladium species with short life of peach trees in Georgia. Phytopathology 61:1095-1096. Cylindrocladium floridanum was recovered from soil around roots of dying and dead peach trees in 6 of 10 orchards with a history of short life. Soil from one orchard also yielded C. scoparium. Both species caused root rot of peach seedlings, but isolates of C. floridanum were generally more virulent than were those of C. scoparium.
583. Weaver, D. J. 1971. Control of Cylindrocladium floridanum with potassium azide in soil. Plant Dis. Rep. 55:1094-1096. Potassium azide controlled microsclerotia of C. floridanum in artificially infested soil incubated at 4°, 10°, or 20° C. Lower concentrations of KN<sub>3</sub> were somewhat more effective in controlling the fungus in pasteurized than in natural soil.
584. Weaver, D. J. 1971. Influence of soil temperature on root rot of peach caused by Cylindrocladium floridanum. (Abstr.) Phytopathology 61:915-916. Six-week-old 'Elberta' peach seedlings were transplanted into steam-sterilized soil, either noninfested or infested with microsclerotia of C. floridanum, and maintained in water baths at

- 14°, 20°, 25°, and 30° C in the greenhouse. C. floridanum was readily isolated from roots of inoculated seedlings. Root rot was slight at 15° C, moderate at 20° C and severe at 25° and 30° C. Generally, soil temperatures that favored root rot were less favorable for growth of roots.
585. Weaver, D. J. 1973. Influence of root injury on the invasion of peach roots by isolates of Clitocybe tabescens. (Abstr.) Phytopathology 63:449. These data are also presented by the author in No. 586.
586. Weaver, D. J. 1974. Effect of root injury on the invasion of peach roots by isolates of Clitocybe tabescens. Mycopathol. Mycol. Appl. 52:313-317. Injured and uninjured roots of peach trees in the field were inoculated with several isolates of C. tabescens. After 2 years, most of the isolates had infected the injured roots, whereas only a few isolates infected the uninjured roots. The fungus usually was more extensively distributed in the injured roots.
587. Weaver, D. J. 1974. Growth and production of microsclerotia of two Cylindrocladium species with various carbon and nitrogen sources. Can. J. Bot. 52:1665-1668. Galactose, glucose, maltose, and mannose supported optimum growth of C. scoparium in buffered liquid media. Growth of C. floridanum was maximum on cellobiose, sorbose, and xylose, but growth was only slight on maltose and galactose. Both fungi used several amino acids and grew well on peptone, ammonium nitrate, ammonium sulfate, potassium nitrate, sodium nitrate, and urea. C. floridanum grew well on sodium nitrate, but C. scoparium made only slight growth on this nitrogen source. Ammonium and nitrate compounds inhibited production of microsclerotia by both fungi.
588. Weaver, D. J. 1974. A gummosis disease of peach trees caused by Botryosphaeria dothidea. Phytopathology 64:1429-1432. Gummosis bark disease is reported as a serious disease in central Georgia for about 4 years. B. dothidea was found to be the causal agent. Symptoms include gum deposits on trunks, limbs, and twigs. In addition, symptoms include lesions around lenticels-, circular- to oval-shaped necrotic areas in bark beneath infected lenticels, and blisters on the surface of shoots and twigs.
589. Weaver, D. J. 1974. Conversion of phenolic compounds to fluorescent compounds by pseudomonas isolated from peach trees in the Southeast. (Abstr.) Am. Phytopath. Soc. Proc. 1:168. Pseudomonads isolated from peach trees were streaked on King's medium B and on fresh PDA or PDA amended with ground dried peach twigs and adjusted to pH 7.5. Within 24 h all isolates produced green fluorescent pigments on King's medium B. On the peach twig PDA medium, isolates which were oxidase negative and pathogenic to peach seedlings either did not fluoresce or produced yellow and/or blue-green fluorescent compounds in the agar.
590. Weaver, D. J. 1975. Gummosis --New disease threatens Southeast. Fruit Grow. 95:16. This is a popular article on gummosis of peaches that presents no new data but gives a general discussion of the disease.
591. Weaver, D. J. 1976. Peach tree gummosis--a serious new disease. Fruit South 1:4-5. This is a popularized article that discusses gummosis from its first recognition as a serious disease in 1960, to its symptoms, spread, growth, characteristics, and possible economic significance.
592. Weaver, D. J. 1977. Interaction between Pseudomonas syringae and freezing on development of bacterial canker in excised peach twigs. (Abstr.) Proc. Am. Phytopath. Soc. 4:118. This abstract is presented as a full-length paper in No. 595.
593. Weaver, D. J. 1978. Research on peach tree short life. Proc. Ill. Hortic. Soc., 40th, pp. 145-148.



- This paper is not available from any source.
594. Weaver, D. J. 1978. Gummosis threat to peach industry continues to grow in Southeast. The Grower, April, p. 10B. This is a popular article that discusses gummosis disease of peaches in a general way. No new data are presented.
  595. Weaver, D. J. 1978. Interaction of Pseudomonas syringae and freezing in bacterial canker on excised peach twigs. Phytopathology 68:1460-1463. A test tube incubation technique was used to study the effect of freezing on the development of bacterial canker symptoms in excised peach twigs. Bark cankers with a characteristic water-soaked appearance and sour-sap odor developed only on twigs that were frozen at -10° C after inoculation with P. syringae and then incubated at 15° C; neither freezing nor inoculation alone produced cankers.
  596. Weaver, D. J. 1979. Role of conidia of Botryosphaeria dothidea in the natural spread of peachtree gummosis. Phytopathology 69:330-334. Symptoms of peachtree gummosis were visible 9-13 months after healthy limbs were exposed for 30-day periods to conidia of B. dothidea. Experimental inoculations in July caused significantly more infections than those at other times. The optimum temperatures for germination and germ-tube growth of conidia obtained from diseased wood or agar cultures were 25° and 35° C, respectively.
  597. Weaver, D. J.; Doud, S. L.; and Wehunt, E. J. 1979. Evaluation of peach seedling rootstocks for susceptibility to bacterial canker caused by Pseudomonas syringae. Plant Dis. Rep. 63:364-367. Tests reported from rootstock selections and 'Redhaven' scions budded on different rootstocks showed that the type of rootstock significantly affected the susceptibility of peach trees to bacterial canker. Seedlings of 'Lovell', NA-8, and 152-A1-2 were highly resistant to bacterial canker as were 'Redhavens' budded to these scions. Seedlings of NRL-4, 'Siberian C' and 'Tzim Pee Tao' rootstocks were highly susceptible as were 'Redhaven' budded to these stocks. The numbers of ring nematodes found in the plots did not correlate with the incidence of bacterial canker.
  598. Weaver, D. J., and Dowler, W. M. 1975. Association between element content and susceptibility to short life of dormant peach trees. (Abstr.) Proc. Am. Phytopathol. Soc. 2:57-58. These data are presented by the authors in a full-length paper in No. 599.
  599. Weaver, D. J.; Dowler, W. M.; and Nesmith, W. C. 1976. Association between elemental content of dormant peach trees and susceptibility to short life. J. Am. Soc. Hortic. Sci. 101:486-489. During winter months, concentrations of K, Ca, Al, Sr, B and Zn were significantly greater in twigs of apparently healthy, dormant peach trees grown on old peach orchard sites than in twigs of apparently healthy trees on adjacent new sites. Later in the spring, tree mortality and injury from cold and bacterial canker were also much greater on the old sites. The conclusion is made that accumulation of certain elements during dormancy in peach twigs may be an indicator that the trees have been predisposed to short life.
  600. Weaver, D. J., and Payne, J. A. 1971. A new pecan disease--clitocybe root rot. Pecan Q. 5:6-7. A root rot caused by the fungus Clitocybe tabescens is reported from pecans in an orchard near Byron, Ga. The pathogen is reported as having a wide host range including elm, oak, peach and pine trees. The fungus infects the trees through the roots and grows between the bark and wood. The first visible symptoms are usually reddish-brown mushrooms that appear only in late summer. Aerial photography was beneficial in locating infected trees.

601. Weaver, D. J.; Raju, B. C.; Wells, J. M.; and Lowe, S. K. 1980. Occurrence in johnsongrass of rickettsia-like bacteria related to the phony peach disease organism. Plant Dis. 64:485-486. Rickettsialike bacteria (RLB) were consistently observed in KOH extracts of johnsongrass stems collected in peach orchards with phony disease. Electron microscopic examination of xylem in leaves of johnsongrass revealed RLB morphologically similar to bacteria associated with phony peach and other xylem-limited, leafhopper-vectored diseases. Johnsongrass RLB were antigenically related to RLB associated with phony peach and Pierce's diseases. RLB in johnsongrass are closely related to the phony disease organism, and johnsongrass is a possible natural reservoir of RLB associated with phony peach disease.
602. Weaver, D. J., and Wehunt, E. J. 1974. Effect of soil pH on susceptibility of peach seedlings to Pseudomonas syringae. (Abstr.) Proc. Am. Phytopathol. Soc. 1:73. These data are presented by the authors in a full-length paper in No. 603.
603. Weaver, D. J., and Wehunt, E. J. 1975. Effect of soil pH on susceptibility of peach to Pseudomonas syringae. Phytopathology 65:984-989. Peach seedlings were grown in soil from a short life site and artificially inoculated with P. syringae. After 7 weeks, some death had occurred in soil with the pH adjusted to 5.6 or 6.1, but no death had occurred when the pH was adjusted to 6.4, 6.6, 6.9, or 7.2. The percentage of dry matter in roots was also greater for plants grown at pH 6.4-6.9. The number of propagules of Pythium spp. in soil and recovered from the roots was positively correlated with soil pH. Population of C. xenoplax was greater in soil adjusted above pH 6.1, but the differences were not significant.
604. Weaver, D. J., and Wehunt, E. J. 1976. Control of peachtree short life with hydrated lime and soil fumigation. Proc. Natl. Peach Counc. 35:52-53. Annual postplant fumigation either alone or in combination with lime kept all trees alive. The combination of preplant fumigation plus 12 lb of hydrated lime also kept all trees alive, and only 14 percent of the trees were killed when 12 lb of lime were used alone. This high lime rate resulted in an increase in pH from 4.7 to 6.9 in the top 2 feet of soil.
605. Weaver, D. J., and Wehunt, E. J. 1976. Control of peach tree short life with hydrated lime and soil fumigation. (Abstr.) Proc. Am. Phytopathol. Soc. 3:270. These data are presented in a full-length paper in No. 604.
606. Weaver, D. J.; Wehunt, E. J.; and Dowler, W. M. 1974. Association of tree site, Pseudomonas syringae, Criconeoides xenoplax and pruning date with short life of peach trees in Georgia. Plant Dis. Rep. 58:76-79. Peach trees grown on an old orchard site were killed by cold injury and bacterial canker, but the death of trees was not influenced by time of pruning. On an adjacent site on which peaches had never been grown, early pruning caused trees to be more susceptible to cold damage, but the trees recovered and none died. Almost no bacterial canker was observed in trees on the new site, although the pathogen was present. Larger numbers of C. xenoplax were usually found in soil around trees on the old site than on the new site.
607. Wehunt, E. J. 1972. Influence of temperature on infection of Meloidogyne incognita acrita on 'Nemaguard' peach seedlings. Plant Dis. Rep. 56:305-308. 'Nemaguard' peach roots observed 75 days after inoculation with M. incognita were lightly galled at constant temperatures of 20°, 25°, and 35° C and moderately galled at 30° C. Longest survival of the nematode was on peach at 30° C and on tomato at 25° C when compared with other temperature treatments.



608. Wehunt, E. J. 1973. Sodium-containing detergents enhance the extraction of nematodes. J. Nematol. 5:79-80. A procedure for extraction of nematodes from clay soil using an Electrasol detergent to disperse the soil particles is given.
609. Wehunt, E. J. 1978. Nematodes in peach orchards, effects and control. Proc. Ark. State Hortic. Soc. Annu. Meet. 99:52-58. Nematode problems in peaches are assessed by making surveys to determine the occurrence and distribution of nematode species and by conducting replicated experiments to determine the effects of the nematodes on the plants.
610. Wehunt, E. J. 1979. Soil fumigation for peach site replanting. Proc. Annu. Meet. 111. State Hortic. Soc. 123:33-36. This is a restatement of a paper published in No. 609.
611. Wehunt, E. J.; Alden, J. C.; and Smith, H. R. 1975. Survival of peach trees on a short life site in Georgia after treatment with potassium azide. (Abstr.) J. Nematol. 7:331. These data are presented in a full-length paper in No. 614.
612. Wehunt, E. J., and Good, J. M. 1974. Nematodes on peaches. In N. F. Childers (ed.), The Peach: Varieties, Culture, Marketing and Pest Control, pp. 223-231. Commerce Department, Cook College, Rutgers University, New Brunswick, N.J. This is a review article on all the nematode species that are found in peach orchards. No new data are presented.
613. Wehunt, E. J., and Good, J. M. 1975. Nematodes on peaches. In N. F. Childers (ed.), The Peach: Varieties, Culture, Marketing and Pest Control, pp. 377-387. Commerce Department, Cook College, Rutgers University, New Brunswick, N.J. 3d Ed. This is a review article on all the nematode species that are found in peach orchards. It is a restatement of the earlier chapter published in No. 612.
614. Wehunt, E. J.; Horton, B. D.; and Prince, V. E. 1980. Effects of nematicide, lime and herbicide on a peachtree short life site in Georgia. J. Nematol. 12:183-189. Mortality of trees caused by peachtree short life was reduced to 29 percent by preplanting plus postplanting application of DBCP and with herbicide weed control. Lime applications did not affect tree growth or survival but did increase yield. Survival was higher with weed control by a herbicide than with control by disk cultivation. The nematode Meloidogyne xenoplax was the species implicated as influencing the susceptibility of trees to peachtree short life.
615. Wehunt, E. J., and Weaver, D. J. 1972. Effect of nematodes and Fusarium oxysporum on the growth of peach seedlings in the greenhouse. (Abstr.) J. Nematol. 4:236. Pathogenicity to peach of the nematodes Hoplolaimus galeatus, Tylenchorhynchus claytoni, Pratylenchus vulnus, Criconeoides xenoplax, and Meloidogyne incognita acrita and the fungus Fusarium oxysporum were studied in a greenhouse test. Two-month-old peach seedlings were planted in containers of pasteurized soil infested with F. oxysporum and in noninfested soil. Three days later, nematodes were added. Five replications of all possible combinations of nematodes and fungus with appropriate controls were tested. Seventy-five days later, plants growing in the Fusarium-Hoplolaimus-infested soil were markedly smaller than the plants in the other treatments.
616. Wehunt, E. J., and Weaver, D. J. 1980. Effect of high rates of calcium and magnesium soil amendments on Macroposthonia xenoplax and bacterial canker of peach seedlings. J. Nematol. 12:240. Three months after inoculation, plants in hydrated lime treatments had less canker development than those in other treatments, but differences were not significant.
617. Wehunt, E. J.; Weaver, D. J.; and Doud, S. L. 1976. Effect of peach

- rootstock and lime on Criconemoides xenoplax. (Abstr.) J. Nematol. 8:304. Data are presented that indicate the population density of C. xenoplax can be influenced by peach rootstocks and that liming the soil can at least temporarily influence the population.
618. Weinberger, J. H. 1939. Studies on the use of certain dinitro-phenol compounds to break the rest period in peach trees. Proc. Am. Soc. Hortic. Sci. 37:353-358. The use of dinitrophenol compounds to break dormancy in peach trees had little advantage in orchards located at Fort Valley, Ga., during the 2 years of tests. However, the sprays were beneficial in both years in orchards near Albany, Ga. where cold weather was insufficient to break dormancy.
619. Weinberger, J. H. 1941. Studies on time of peach thinning from blossoming to maturity. Proc. Am. Soc. Hortic. Sci. 38:137-140. With early peach varieties under Georgia conditions, it is desirable to thin as early in the season as practicable. While thinning in the bloom is advantageous, especially where a heavy set of fruit is in prospect, the hazards involved cannot be overlooked. A light blossom thinning, supplemented by another thinning 6 weeks later, would probably be the more successful under average conditions.
620. Weinberger, J. H. 1944. Characteristics of the progeny of certain peach varieties. Proc. Am. Soc. Hortic. Sci. 45:233-238. This paper presents a summary of the progeny behavior of 23 peach crosses and 4 selfs. Included are blossom type, skin color, bud set, size of fruit, color, firmness, etc.
621. Weinberger, J. H. 1944-1954. Notices (9) to fruit growers and nurserymen relative to the naming and release of the varieties Dixigem, Cardinal, Dixired, Southland, Redcap, Hiland, Coronet, Maygold, and Keystone were issued during these 10 years. All are on file in the Byron library.
622. Weinberger, J. H. 1948. Influence of temperature following bloom on fruit development period of Elberta peach. Proc. Am. Soc. Hortic. Sci. 41:175-178. Many factors aside from temperature, such as size of crop, age of tree, growth of tree, and nitrogen supply, affect the length of the fruit development period. However, by correcting the average length of the fruit development period for early season temperature effects, more than half of the variability between the expected and the observed date of ripening can be eliminated.
623. Weinberger, J. H. 1948. The Dixired, Dixigem, and Southland peaches. USDA Circ. 766. The three new peach varieties listed are described in detail.
624. Weinberger, J. H. 1949. Some effects of nitrogen fertilizer on yield and maturity of Elberta peaches. Proc. Am. Soc. Hortic. Sci. 53:57-61. Spring applications of inorganic fertilizers were more effective in increasing yield and growth of 'Elberta' peach trees than fall or afterharvest applications but also delayed maturity of the fruit the most. Afterharvest applications stimulated growth of tree with a minimum effect in retarding maturity of fruit. Cottonseed meal was relatively ineffective as a source of nitrogen under the conditions of this test.
625. Weinberger, J. H. 1950. Prolonged dormancy of peaches. Proc. Am. Soc. Hortic. Sci. 56:129-133. This article is similar to that published in No. 618.
626. Weinberger, J. H. 1950. Chilling requirements of peach varieties. Proc. Am. Soc. Hortic. Sci. 56:122-138. In the extreme southern peach-growing regions of the Southeast, the most dependable production may be anticipated from those varieties that have a chilling requirement slightly higher than the minimum Feb. 15 chilling accumulation of the locality involved. A rest period of this intensity is sufficient to



- delay blossoming following normal or colder than normal winters until the frost hazard is reduced but will not cause serious prolonged dormancy trouble following milder winters. Varieties with slightly high chilling requirements would succeed if they have strong fruit-setting habits.
627. Weinberger, J. H. 1951. Effect of 2,4,5-trichlorophenoxyacetic acid on ripening of peaches in Georgia. *Proc. Am. Soc. Hortic. Sci.* 57:115-119. The use of 2,4,5-T spray to hasten ripening of peaches advanced maturity 1 to 17 days for the various treatments but adversely affected size, color, shape, firmness, and quality of the fruit under the conditions of this test.
628. Weinberger, J. H. 1952. Winter injury to peach trees on Yunnan stock. *Plant Dis. Rep.* 36:307-308. In the central Georgia region, 'Yunnan' rootstocks increase susceptibility of varieties to winter injury.
629. Weinberger, J. H. 1954. Effects of high temperatures during the breaking of the rest of Sullivan Elberta peach buds. *Proc. Am. Soc. Hortic. Sci.* 63:157-162. Under orchard conditions, brief periods of high temperatures during winter delayed blossoming and foliation and reduced fruit set of 'Sullivan Elberta' peach. Continuous moderately higher temperatures delayed the breaking of rest of flowerbuds more than did brief periods of high temperature, but the latter had a greater delaying effect on leafbuds. Under the conditions of the experiment, high temperatures in December were more critical than those in November. January maximum temperatures were of little importance.
630. Weinberger, J. H. 1954. New peach varieties for the Southeast. *Atlantic Coast Line Agric. Livestock Topics* 6(1):1-3. This is a popular publication and discusses the Cardinal, Redcap, Dixired, Maygold, Coronet, Dixigem, and Southland varieties.
631. Weinberger, J. H. 1955. Peach variety adaptability to southern conditions. *Fruit Var. Hortic. Dig.* 10(3):41-43. This is a popular article that discusses the many factors involved in adaptability. The importance of chill hours is particularly discussed.
632. Weinberger, J. H. 1956. Prolonged dormancy trouble in peaches in the Southeast in relation to winter temperatures. *Proc. Am. Soc. Hortic. Sci.* 67:107-112. The seasonal accumulation of hours of chilling to Feb. 15 gave a correlation of -0.91 with the severity of prolonged-dormancy trouble in peaches in the Southeast. Correlating monthly mean temperatures with prolonged-dormancy trouble resulted in coefficients of 0.28 for November, 0.78 for December, 0.87 for January and 0.57 for February. December and January temperatures were the principal influence in the breaking of the rest of peach buds. The average of December and January means when correlated with prolonged-dormancy trouble gave a coefficient of 0.93. This correlation is equal to that obtained with chilling-hour accumulation, and indicates equal reliability.
633. Weinberger, J. H.; Marth, P. C.; and Scott, D. H. 1943. Inheritance study of root knot nematode resistance in certain peach varieties. *Proc. Am. Soc. Hortic. Sci.* 42:321-325. A series of peach varieties and P.I. numbers are evaluated for resistance to nematode attack.
634. Weinberger J. H., and Prince, V. E. 1962. Notice to fruit growers and nurserymen relative to the naming and release of the 'Dixiland' peach. Introduction notice is on file in Byron, Ga. The peach variety 'Dixiland' is officially released to producers by USDA.
635. Weinberger, J. H., and Prince, V. E. 1962. Notice to fruit growers and nurserymen relative to the naming and release of the 'Suwanee' peach. Introduction notice is on file in Byron, Ga. The peach variety 'Suwanee' is officially released to producers by USDA.

636. Weinberger, J. H.; Prince, V. E.; and Havis, Leon. 1949. Tests on foliar fertilization of peach trees with urea. Proc. Am. Soc. Hortic. Sci. 53:26-28. In tests with urea applied on the foliage of peach trees, this method of applying nitrogen was not effective either at Beltsville, Md. or Fort Valley, Ga. If any of the nitrogen in the urea was utilized in the peach leaves, it was in such small quantities that it did not show significant effects on color or nitrogen content of foliage, on color or time of ripening of fruit, or on terminal growth of trees.
637. Wells, J. M. 1973. Postharvest wax-fungicide treatments of nectarines, peaches, and plums for: reducing decay, reducing moisture loss, and enhancing external appearance. U.S. Dep. Agric. Mark. Res. Rep. 981, 6 pp. In postharvest tests, 450 ppm Botran plus 33 to 333 ppm benomyl were as effective in reducing decay as commercially used wax treatments with 1,800 ppm Botran. Supplements of 100 or 333 ppm EL-273 or Mertect to 450 ppm Botran were also effective. Botran plus 333 ppm benomyl resulted in a 95 percent reduction of decay and a 70 percent reduction in weight loss where the fruit was stored for 3 days at 37° F and then held for 3 to 5 days at 70° F.
638. Wells, J. M. 1974. Toxigenic Aspergillus and Penicillium isolates from weevil-damaged chestnuts. (Abstr.) Proc. Am. Phytopathol. Soc. 1:103. These data are presented as a full-length paper in No. 661.
639. Wells, J. M. 1975. Hydrocooling and hydraircooling waxed peaches. Proc. Natl. Peach Council. 34:21-24. Postharvest research has developed two areas of technology--water-insoluble wax coating and hydraircooling--that will soon permit the grower to ship or commit to storage waxed peaches that have been cooled to the lowest possible temperatures while on the packing line.
640. Wells, J. M. 1976. Sour rot of peaches caused by Monilia implicata and Geotrichum candidum. (Abstr.) Proc. Am. Phytopathol. Soc. 3:254. This is an abstract of the paper published in No. 636.
641. Wells, J. M. 1976. Sour rot of peaches. Fruit South 1:18-19. Sour rot is cited as a new post-harvest disease problem of peaches. Botran and Benlate provided good control of brown rot but was ineffective against sour rot. Control of sour rot required chlorination of dump tank water, chlorination of hydrocooling water, and careful removal of all overripe, bruised, and damaged fruit.
642. Wells, J. M. 1977. Sour rot of peaches caused by Monilia implicata and Geotrichum candidum. Phytopathology 67:404-408. These data have already been published in No. 636.
643. Wells, J. M. 1978. Control of postharvest diseases of peaches in the U.S.A. (Abstr.) Proc. Intl. Conf. Plant Pathol., 3d, p. 272. These data are also presented in Nos. 636 and 637.
644. Wells, J. M. 1978. USDA role in providing better pesticides and pest management systems for the pecan industry. Proc. Ga. Pecan Grow. Assoc., 13th, 9:16-18. This paper contains no new data but discusses the general effort at the Byron laboratory to evaluate and register new pesticides. The Byron effort to develop pest-management programs is also cited.
645. Wells, J. M. 1979. Seasonal distribution of rickettsia-like bacteria in phony peach trees. Proc. Fla. Hortic. Soc. 92. This paper is not available from the National Agricultural Library.
646. Wells, J. M. 1981. Toxigenic fungi isolated from late-season pecans. J. Food Saf. 2:213-220. Of 1978 fungal colonies isolated on malt-salt agar from twenty 5-kg samples of pecans harvested late in the season, 39 percent were Cladosporium, 21 percent were Penicillium, 9 percent were Alternaria or Epicoccum, 8 percent



- Pesialotia or Monochacta, 4 percent Trichothecium, 4 percent Aspergillus niger, and less and 2 percent were Fusarium, Phomopsis, Rhizopus, Aspergillus, and miscellaneous genera. Forty-four of 260 representative isolates were persistently toxic to day-old cockerels.
647. Wells, J. M., and Baggett, H. V. 1979. Construction of two solar energy heating systems for existing glass greenhouses. Proc. Annu. Conf. Sol. Energy Heat. Greenhouses, 4th, pp. 52-55. Construction of a solar hot-water collector and storage system and a solar hot-air collector and storage system is discussed.
648. Wells, J. M., and Bennett, A. H. 1973. No more rotten peaches. Am. Fruit Grow. 93:12-13. This paper is also published in No. 653.
649. Wells, J. M., and Bennett, A. H. 1976. Hydrocooling and hydrair-cooling with fungicides for reduction of postharvest decay of peaches. (Abstr.) Proc. Am. Phytopathol. Soc. 2:39. Hydrair-cooling treatments with fungicides were generally as effective in reducing lesion development as were hydrocooling treatments.
650. Wells, J. M., and Bennett, A. H. 1976. Postharvest decay, weight loss, and fungicide residues on peaches hydro- or hydraircooled before or after waxing. Plant Dis. Rep. 59:931-935. The addition of organic fungicides such as DCNA or benomyl to hydrocooling or hydrair-cooling water did not affect decay development of fruit that was subsequently treated with a wax-fungicide combination. Decay on the different lots of waxed fruit was the same irrespective of the chemicals used on prior precooling treatments. Chlorination, however, of hydro- or hydraircooling water under commercial conditions was shown desirable to prevent the buildup of microbial contaminants.
651. Wells, J. M., and Bennett, A. H. 1976. Hydrocooling and hydrair-cooling with fungicides for reduction of postharvest decay of peaches. Phytopathology 66:801-805. Various tests are reported using Botran and benomyl with hydrair-cooling and hydrocooling treatments. In general, lesions formed by Monilinia fructicola, M. laxa, and Rhizopus stolonifer decreased linearly under both cooling systems with increasing Botran benomyl concentrations.
652. Wells, J. M., and Bennett, A. H. 1977. Flesh texture and respiration of waxed peaches. Proc. Am. Soc. Hortic. Sci. 90:132-134. Respiration of fresh peaches waxed after harvest with a paraffin-base emulsion was significantly lower than that of unwaxed fruit as determined by gas-liquid chromatography. Waxed peaches evolved 12.90 ml of CO<sub>2</sub> per kilogram of fruit per hour at 21° C, compared to 14.56 ml for unwaxed fruit. The decrease in respiration correlated with a significant increase in texture breakdown of the flesh of waxed peaches held for 3 weeks at 1°C compared to unwaxed checks. Although waxing peaches after harvest is an effective treatment to preserve fresh appearance and market quality, its effect on respiration may lead to significant decrease in internal quality after prolonged refrigerated storage.
653. Wells, J. M., and Bennett, A. H. 1977. Waxing fresh-sale peaches. In Norman F. Childers (ed.), The Peach, pp. 477-481. Horticultural Publications, New Brunswick, N.J. Coating peaches with a paraffin or mineral oil-base wax combined with fungicides is an effective supplement to hydrocooling to control decay and to maintain market quality by reducing weight loss. Hydrocooling should precede the waxing operation.
654. Wells, J. M., and Cole, R. J. 1977. Production of penitrem A and an unknown toxin by Penicillium lanoso-coeruleum isolated from weevil-damaged pecans. (Abstr.) Proc. Am. Phytopathol. Soc. 3:343. These data are presented in a full-length paper in No. 650.

655. Wells, J. M., and Cole, R. J. 1977. Production of penitrem A and an unknown toxin by Penicillium lanoso-coeruleum isolated from weevil-damaged pecans. Phytopathology 67:779-782. Chloroform extracts of P. lanoso-coeruleum isolates from weevil-damaged pecans and grown on a medium of shredded wheat, yeast extract, and sucrose were toxic to 1-day-old cockerels, producing sustained tremors and convulsions prior to mortality. Two toxic fractions were separated from chloroform extracts by sequential elution from silica-gel columns with diethyl ether and acetone. The fraction for ether was identical to that for penitrem A, but the chemical identity of the toxin in the acetone fraction was not determined.
656. Wells, J. M.; Cole, R. J.; Cutler, H. G.; and Spalding, D. H. 1981. Curvularia lunata, a new source of cytochalasin B. Appl. Environ. Microbiol. 41:967-971. A biologically active metabolite was found in crude extracts of Curvularia lunata (Wakker) Boedijn (ATCC 34690) isolated from decayed tissues of litchi fruit (Litchi chinensis Sonn.). The crystalline preparation was identified as 97 percent cytochalasin B and 3 percent cytochalasin A.
657. Wells, J. M.; Cole, R. J.; and Kirksey, J. W. 1975. Emodin, a toxic metabolite of Aspergillus wentii isolated from weevil-damaged chestnuts. (Abstr.) Proc. Am. Phytopathol. Soc. 2:143. These data are presented in a full-length paper in No. 653.
658. Wells, J. M.; Cole, R. J.; and Kirksey, J. W. 1975. Emodin, a toxic metabolite of Aspergillus wentii isolated from weevil-damaged chestnuts. Appl. Microbiol. 30:26-28. A diarrheagenic toxin from culture extracts of Aspergillus wentii isolated from weevil-damaged Chinese chestnuts is identified as emolin.
659. Wells, J. M.; Cutler, H. G.; and Cole, R. J. 1976. Toxicity and plant growth regulator effects of cytochalasin H isolated from Phomopsis sp. Can. J. Microbiol. 22:1137-1143. A biologically active metabolite was found in crude extracts of an unidentified species of Phomopsis isolated from weevil-damaged pecans. Purified metabolite was toxic to day-old cockerels and was markedly inhibitory to growth and floral development of tobacco plants.
660. Wells, J. M.; Cutler, H. G.; and Cole, R. J. 1976. Toxicity and plant growth regulator effects of cytochalasin H isolated from Phomopsis sp. (Abstr.) Proc. Am. Phytopathol. Soc. 3:282. These data are presented in a full-length paper in No. 654.
661. Wells, J. M.; Cutler, H. G.; and Cole, R. J. 1977. Curvularia lunata, a new source of cytochalasin B. (Abstr.) Proc. Am. Phytopathol. Soc. 4:231. These data are also published as a full-length paper in No. 651.
662. Wells, J. M., and McMeans, J. L. 1978. Rancidity, iodine values and oil contents of 21 varieties and selections. Proc. Southeast. Pecan Grow. Assoc. 71:159-162. Data are presented that establish iodine values as a method to predict the flavor stability of shelled pecans. The values of 21 pecan cultivars are also given.
663. Wells, J. M.; McMeans, J. L.; and Payne, J. A. 1980. Pecan oil content and composition as affected by variety and orchard conditions. Proc. Southeast. Pecan Grow. Assoc. 73:112-113. Nut quality, in terms of flavor stability, is related more to the chemical composition of the oil rather than directly to the oil content. Pecan cultivars that have a tendency toward rancidity are consistent in having low values for unsaturation.
664. Wells, J. M., and Payne, J. A. 1974. Mycoflora of pecans treated with heat, low temperatures, or methyl bromide for control of the pecan weevil. (Abstr.) Proc. Am. Phytopathol. Soc. 1:168. These data are also published as a full-length paper in No. 660.



665. Wells, J. M., and Payne, J. A. 1975. Mycoflora of pecans treated with heat, low temperatures, or methyl bromide for control of the pecan weevil. *Phytopathology* 65:1393-1395. Fungus infection of weevil-damaged pecan kernels was reduced to percentages of 8.0 to 15.3, by hot water dips at 60° C for 10 and 15 minutes, or at 77° C for 3 minutes, and by steam treatments for 3 minutes, compared with infection of 81.6 percent in the controls. Average infection on pecans stored at -6° C was reduced to 56.3 percent, but was not affected by storage at 0° or 6° C. Methyl bromide fumigation reduced infection on pecans treated at 1.6 and 3.3 kg/100 m<sup>3</sup>, but not at 0.8 kg/100 m<sup>3</sup>. Genera of fungi isolated and identified from untreated weevil-damaged kernels were principally Penicillium, Alternaria, Pestalotia, Monochaeta, Cladosporium, Fusarium, Phoma, and Aspergillus.
666. Wells, J. M., and Payne, J. A. 1975. Toxigenic Aspergillus and Penicillium isolates from weevil-damaged chestnuts. *Appl. Microbiol.* 30:536-540. Aspergillus and Penicillium were among the most common genera of fungi isolated on malt-salt agar from weevil-damaged Chinese chestnut kernels. Chloroform extracts of many of the isolates were toxic when fed to day-old cockerels.
667. Wells, J. M., and Payne, J. A. 1975. Toxigenic species of Penicillium, Fusarium, and Aspergillus from weevil-damaged pecans. (Abstr.) *Proc. Am. Phytopathol. Soc.* 2:39. These data have also been presented as a full-length paper in No. 664.
668. Wells, J. M., and Payne, J. A. 1976. Incidence of aflatoxin contamination on a sampling of Southeastern pecan. *Proc. Fla. Hortic. Soc.* 89:256-257. Two hundred and twenty-nine samples of nuts were collected from commercial shelling plants and orchards in the Southeast in 1974-75 and analyzed for aflatoxins. A violative level of aflatoxins was present in only one sample.
669. Wells, J. M., and Payne, J. A. 1976. Toxigenic species of Penicillium, Fusarium, and Aspergillus from weevil-damaged pecan. *Can. J. Microbiol.* 22:281-285. Of a total of 2,392 fungi isolated from weevil-damaged pecans, 46.4 percent were Alternaria and Epicoccum, 23.9 percent were Penicillium, 12.4 percent were Pestalotia and Monochaeta, 6.5 percent were Cladosporium, 6.4 percent were Fusarium, and less than 2 percent each were Phoma, Aspergillus, Rhizopus, Trichothecium, and miscellaneous. Chloroform extracts of 34 to 105 representative Penicillium isolates, 3 of 28 Fusarium isolates, and 3 of 23 Aspergillus isolates were toxic to day-old cockerels during 3 bioassays.
670. Wells, J. M., and Payne, J. A. 1979. Mycoflora and market quality of chestnuts treated with hot water for control of the chestnut weevil. (Abstr.) *Phytopathology* 69:533. These data are presented in a full-length paper in No. 668.
671. Wells, J. M., and Payne, J. A. 1980. Reduction of mycoflora and control of inshell weevils in pecans stored under high carbon dioxide atmospheres. (Abstr.) *Phytopathology* 70:572. These data are presented in a full-length paper in No. 667.
672. Wells, J. M., and Payne, Jerry A. 1980. Reduction of mycoflora and control of in-shell weevils in pecans stored under high carbon dioxide atmospheres. *Plant Dis.* 64:997-998. High carbon dioxide (CO<sub>2</sub>) atmospheres reduced the mycoflora and controlled in-shell weevils in pecans stored under accelerated storage conditions of 7° C and 65 percent relative humidity. After 5 mo in atmospheres of 21 percent oxygen (O<sub>2</sub>) and 30 percent CO<sub>2</sub>, pecan weevil mortality was 100 percent, total mycoflora isolated from kernels was significantly reduced, and off-flavors

had not yet developed in the kernels. In atmospheres of 3 and 10 percent CO<sub>2</sub> (plus 21 percent O<sub>2</sub>) or in 1 percent O<sub>2</sub> (with or without 30 percent CO<sub>2</sub>), weevil mortality was less than 100 percent. Objectionable off-flavors developed in high CO<sub>2</sub> atmospheres after 6 mo.

673. Wells, J. M., and Payne, Jerry A. 1980. Mycoflora and market quality of chestnuts treated with hot water for control of the chestnut weevil. *Plant Dis.* 64:999-1000. Postharvest treatment of Chinese chestnuts in 52° C water for 5, 15, or 30 min reduced the percentage of fungal infections of weevil-damaged and discolored kernels and the number of fungal colonies isolated compared with untreated checks. Immersion for 60 min was significantly more effective against fungi than the shorter treatments, but soluble sugars decreased and starch increased over 5-mo storage at 3° C, thereby slightly lowering market quality. Addition of Botran reduced the total number of colonies isolated and the percentage of infected kernels more than did the 30-min hot-water treatment alone but not more than the 5, 15, or 60 min treatments.
674. Wells, J. M.; Payne, J. A.; and McGlohon, N. E. 1974. The effectiveness of various fungicide rates and intervals of application for scab and mildew control. *Proc. Ga. Pecan Grow. Assoc.* 5:11-12. These data were also published in Nos. 670 and 671.
675. Wells, J. M.; Payne, J. A.; and McGlohon, N. E. 1974. Testing Benlate rates in Georgia. *Pecan South* 1:32,38. These data were also published in Nos. 669 and 671.
676. Wells, J. M.; Payne, J. A.; and McGlohon, N. E. 1974. The effectiveness of various fungicide rates and intervals of application for scab and mildew control. *Proc. Southeast. Pecan Grow. Assoc.* 67:137-138. Tests are reported that conclude 0.5 lb of Benlate is not adequate for controlling scab or powdery mildew when used at a 3-week interval under normal weather conditions. When used at 1 lb per acre, Benlate controlled scab up to 4 weeks and mildew up to 3 weeks. Du-Ter also controlled scab when used at 1 lb/acre at a 3-week interval but was only about 50 percent effective against powdery mildew.
677. Wells, J. M.; Payne, J. A.; and McGlohon, N. E. 1975. Pecan scab and powdery mildew suppression with extended interval applications of benomyl and triphenyltin hydroxide. *Plant Dis. Rep.* 59:448-451. Applications of benomyl at 0.1 lb/tree at 4-week intervals were as effective in suppressing scab on 'Schley' pecans as applications at 3-week intervals. Applications of 0.05 lb/tree did not give adequate control on 'Stuarts', benomyl at 0.05 lb/tree or TPTH at 0.08 lb/tree applied at 4- or 5- week intervals gave adequate control. Powdery mildew was also controlled at these rates and intervals of application.
678. Wells, J. M.; Payne, J. A.; and McGlohon, N. E. 1975. Fungicide evaluations on Schley pecans in Byron, Georgia. *Proc. Southeast. Pecan Grow. Assoc.* 68:37-38. Benlate or Du-Ter sprayed at recommended rates and for the full season gave good scab control. Difolatan gave moderate control and sulfur poor control. The addition of sulfur to Du-Ter enhanced control. Three double-rate applications of Benlate plus oil wax was as effective as the regular recommended nine applications at 0.1 lb/acre.
679. Wells, J. M.; Payne, J. A.; and McGlohon, N. E. 1975. Fungicide tests on Schley pecans at Byron, Ga. *Pecan South* 2:147. These data have also been presented in No. 673.
680. Wells, J. M.; Payne, J. A.; and McGlohon, N. E. 1976. Suppression of pecan scab in Georgia with abbreviated spray programs. *Plant Dis. Rep.* 60:953-956. During the



- unseasonably dry year of 1974, three applications of benomyl at double the recommended dosage were as effective in suppressing scab on 'Stuart' and 'Schley' pecan fruit as the recommended spray schedule of nine applications. During the unseasonably wet year of 1975, the abbreviated spray program was effective only on the scab-tolerant cultivar, 'Stuart'. Abbreviated spray schedules could reduce scab-management costs in pecan orchards by 50 percent.
681. Wells, J. M.; Payne, J. A.; and McGlohon, N. E. 1976. Chemical control of pecan scab and scorch in a year of severe disease incidence. *Proc. Southeast. Pecan Grow. Assoc.* 69:59-63. Data are presented that show TPTH and benomyl compatible when used as a mixture or in alternate spray regimes. Difolatan controlled scab in the dry season of 1974 but failed to give good control on 'Schleys' during the wet season of 1975. In 1974 benomyl and TPTH applied less often but at higher rates gave good scab control on 'Stuarts' and 'Schleys', but the control obtained was not adequate on 'Schleys' during 1975. Difolatan was the most effective material in controlling leaf scorch.
682. Wells, J. M.; Payne, J. A.; and McGlohon, N. E. 1976. Fungicides for control under adverse disease conditions of pecan. *Proc. Ga. Pecan Grow. Assoc.* 7:28-32. These data have also been presented in Nos. 674 and 676.
683. Wells, J. M.; Raju, B. C.; Nyland, G.; and Lowe, S. K. 1981. Medium for isolation and growth of bacteria associated with plum leaf scald and phony peach diseases. *Appl. Environ. Microbiol.* 42:357-363. Rickettsialike bacteria associated with plum leaf scald and phony peach diseases were isolated from diseased but not from healthy tissues and cultured on buffered charcoal-yeast extract medium. Optimum conditions for isolation and growth on medium were pH 6.5 to 6.9 at 20° and 25° C under normal atmosphere. Growth on primary colonies and first-passage subcultures was restricted, and colonies reached a maximum diameter of 0.6 mm in 60 days. After 12 passages, subcultures reached maximum growth in 21 days.
684. Wells, J. M.; Raju, B. C.; Thompson, J. M.; and Lowe, S. N. 1981. Etiology of phony peach and plum leaf scald diseases. *Phytopathology* 71:1156-1161. Rickettsialike bacteria (RLB), previously associated with phony peach disease (PPD) and plum leaf scald (PLS), were transmitted from peach trees with PPD symptoms to plum and from plum trees with PLS symptoms to peach by grafts of root sections. Symptoms of PLS appeared on plants of plum cultivars Ozark Premier, Methley, Santa Rosa, and Shiro 9 mo after they had received root grafts from Dixiland peach with PPD symptoms. Grafted plum had RLB that appeared to be identical to those associated with PPD, measuring 0.35 x 2.0  $\mu$ m, and shared similar ultrastructural details, including an outer (rippled) trilaminar membrane in the cell wall profile. Graft-transmitted RLB from plum and peach reacted positively to immunofluorescence and enzyme-linked immunosorbent assays conducted with antiserum prepared against RLB associated with PPD.
685. Wells, J. M., and Reveal, L. G. 1976. Hydrocooling peaches after waxing: effects on fungicide residues, decay development and moisture loss. *HortScience* 11:107-108. Postharvest decay and weight loss of peaches coated with a nonemulsified, water-insoluble blend of mineral oil, petrolatum, and paraffin containing 5,000 ppm Botran and 2,500 ppm benomyl were shown unaffected by subsequent hydrocooling even though the residue on peaches was less.
686. Wells, J. M., and Spalding, D. H. 1975. Growth and infectivity of Geotrichum candidum in low oxygen and high carbon dioxide atmospheres. *Phytopathol.* 65:1299-1302.

Growth of Geotrichum candidum on tomatoes was as great or greater in 1 or 3 percent  $O_2$  atmospheres, with or without 3 percent  $CO_2$  as in air. Growth decreased linearly with decreasing  $O_2$  concentrations below 3 percent at concentration of 3 percent or more,  $CO_2$  repressed growth of the fungus in the presence of 21 percent  $O_2$ . In a low  $O_2$  atmosphere, however, 30 percent  $CO_2$  was necessary to repress growth.

687. Wells, J. M., and Weaver, D. J. 1980. Distribution of rickettsia-like bacteria in peach and occurrence in plum, cherry, and some perennial weeds. (Abstr.) Phytopathology 70:572. These data have been presented in a full-length paper in No. 683.
688. Wells, J. M.; Weaver, D. J.; and Raju, B. C. 1980. Distribution of rickettsia-like bacteria in peach and their occurrence in plum, cherry and some perennial weeds. Phytopathology 70:817-820. Rickettsialike bacteria were approximately 10 times more concentrated in 0.1 M KOH extracts of root sections of peach trees with symptoms of phony disease than in twig sections. RLB were also present in symptomless trees in orchards with 7 and 52 percent disease incidence. Positive symptoms of phony disease followed within 3-12 mo of detection of RLB in 8 of 10 initially symptomless trees examined. RLB counts in roots and twigs of peach trees in phony-infected orchards were significantly higher in May than in February, August, or November. RLB were also found in several species of cherry and plum and in perennial weeds surrounding peach orchards. Positive immunofluorescent tests for RLB were obtained with extracts from mazzard cherry, Shiro plum, and johnsongrass.
689. White, A. W., Jr.; Beaty, E. R.; and Tedders, W. L. 1981. Legumes as a source of nitrogen and effects of management practices on legumes in pecan orchards. Proc. Southeast. Pecan Grow. Assoc. 74:97-106. Early studies conducted between 1920 and 1960 on the value of legumes in increasing growth of pecan are reviewed. Data collected in Byron by the authors during 1977-79 on the same subject are presented. The Byron data show that early legume planting in pecan orchards is necessary to obtain satisfactory forage and N production under management conditions. The early planting is especially critical if additional N fertilization is to be applied to pecans the following February.
690. White, A. W., Jr., and Edwards, J. H. 1978. Soil profile distribution and seasonal growth of pecan roots. Proc. Southeast. Pecan Grow. Assoc. 71:47-53. Root growth observations through glass panels showed most roots larger than 10 mm were in the 30- to 60-cm soil-profile zone. Roots smaller than 1 mm were the most numerous and were distributed fairly uniformly throughout the soil profile to about the 90-cm depth. Rooting depth increased with degree of drainage. Rooting activity was variable between season and years, but new roots were more numerous in the top 45-cm soil layer.
691. White, A. W., Jr., and Edwards, J. H. 1980. Soil and root growth studies with pecans at Byron, Georgia. Pecan South 7:14-18. This paper contains data similar to those presented in No. 685.
692. White, A. W., Jr., and Hunter, R. E. 1981. Differences in leaf nutrient concentration from mature Stuart and Schley trees. Pecan South 8:22-23. Data are presented that show significant differences in leaf nutrient concentrations between 'Stuart' and 'Schley' pecan varieties under uniformly fertilized field conditions. The 'Stuart' cultivar was higher in nitrogen, magnesium, iron and boron and lower in potassium than the 'Schley' cultivar.
693. Wood, B. W.; Hunter, R. E.; and McMeans, J. L. 1980. Evaluation of pecan cultivars and promising selections in southwest Georgia.



- Proc. Southeast. Pecan Grow. Assoc. 73:79-83. An evaluation of nine cultivars and five promising USDA selections established on Ducker Plantation in Albany, Ga., is given. All cultivars were compared to 'Desirable' because it is the most commonly planted variety in the Southeast. 'Cape Fear' yielded more pounds of nuts than the other cultivars of equal age. 'GraBohls', 'Chickasaw', and 'Wichita' followed in yield. Total nut yield from the USDA selections was greatest for 61-6-67 and 49-1-478. Observations of kernel color showed 'Forkert' and 49-20-112 as having the best color.
694. Wood, B. W.; Hunter, R. E.; and McMeans, J. L. 1980. Productivity and quality of selected pecan cultivars and USDA selections. Pecan South 8:30-32. These data were also published in No. 688.
695. Wood, B. W.; Hunter, R. E.; and McMeans, J. L. 1981. Productivity and quality of selected pecan cultivars and USDA selections in Georgia. Proc. Ga. Pecan Grow. Assoc. 11:33-39. These data were also published in Nos. 688 and 689.
696. Wood, B. W., and McMeans, J. L. 1981. Carbohydrate changes in various organs of bearing and nonbearing pecan trees. J. Am. Soc. Hortic. Sci. 106:758-761. Starch and sugars were generally higher in bearing than in nonbearing shoots of pecan. Decreases in shoot starch were reflected by generally simultaneous increases in either shoot or kernel sugars. Shoot starch fell to its lowest level during the liquid stage of ovule development. Leaf starch generally declined as the growing season progressed. Total sugar levels rose in the kernel, shuck, and shell during fruit enlargement and declined during kernel growth. Mature kernels had less sugar than mature shucks. Ovule sugar was highest during the liquid stage and decreased to very low levels at maturity. Ovule starch generally increased as kernels matured.
- Y
697. Yadava, U. S.; Doud, S. L.; and Weaver, D. J. 1978. Evaluation of different methods to assess cold hardiness of peach trees. J. Am. Soc. Hortic. Sci. 103:318-321. The reliability, capability to predict survival, and convenience of five cold-hardiness tests--triphenyl tetrazolium chloride reduction (TTC), electrolytic conductance (EC), ninhydrin-reactive compounds (NRC), truck cambial browning (TCB), and bacterial canker development (BCD) were evaluated using previous season's twigs of 'Redhaven' peach during 1976-77 dormancy season. TTC, NRC, and EC were all significantly correlated with TCB as well as percentage of tree survival in the field, and thus proved to be quantitative, reliable, and capable of predicting survival at a later date. No statistical correlation was found between BCD and other hardiness tests.
698. Yonce, C. E. 1975. Peachtree borer and lesser peachtree borer sex pheromones: their potential use in future control programs. Proc. Natl. Peach Council. 34:65-67. This paper is a popular review of the research underway at Byron on pheromones of the LPTB and PTB. Both trapping and confusion as a method of control are discussed.
699. Yonce, C. E. 1978. Methods of evaluating insecticides for control of plum curculio, 1971-75. Insecticide and Acaricide Tests 3:49-50. Results of chemical screening tests for control of the plum curculio from 1971-1975 are given.
700. Yonce, C. E. 1978. Control of plum curculio and other cat-facing insects that damage peach fruit, 1975. Insecticide and Acaricide Tests 3:48-49. Results of chemical control tests for plum curculio and other cat-facing insects in 1975 are given.
701. Yonce, C. E. 1979. Seasonal occurrence and distribution of damage done to peach fruit by plum

- curculio, oriental fruit moth, and cat-facing insects in central Georgia. Fruit South 3:47-51. This is a popular article that cites the plum curculio and cat-facing insects as causing damage early in the season. Damage by the oriental fruit moth was cited as never serious in the study except in late-maturing cultivars. Plum curculio was also a problem in the late-maturing cultivars.
702. Yonce, C. E. 1979. Vectors of phony peach. Proc. Natl. Peach Counc. 38:79-84. The leafhopper species Homalodisca coagulata and H. insolita are cited as the major vectors in south Georgia. Graphocephala versuta is cited as probably responsible for the small amount of phony disease reported in northern Georgia. Clean orchard cultural practices are listed as important to discourage vector movement into the orchard.
703. Yonce, C. E. 1980. New concept of borer control. Proc. Southeast. Peach Conv. 1:58-64. Borers are cited as causing \$3.5 million in damage annually in Georgia, and this figure is 32 percent of the total insect damage. Three years' data on the control of borers by trapping and confusion are given. The result was an increase in borer control with both methods.
704. Yonce, C. E. 1980. Effectiveness of chlorpyrifos for control of Synanthedon pictipes and S. exitiosa in peach orchard test of young trees with emphasis on timing applications. J. Econ. Entomol. 73:827-828. Chlorpyrifos, applied to young peach trees for 3 consecutive years, substantially reduced infestations of the peachtree borer when a single application was made on June 15, July 15, or Aug. 15 each year. A similar trend for control at the same application times appeared to be developing for the lesser peachtree borer.
705. Yonce, C. E. 1981. Mating disruption of the lesser peachtree borer, Synanthedon pictipes (Grote & Robison), and the peachtree borer, S. exitiosa (Say), with a hollow fiber formulation. Misc. Publ. Entomol. Soc. Am. 12:21-29. Mating disruption was tested as a method of controlling the lesser peachtree borer and the peachtree borer. Hollow fiber dispensers placed in each tree of a 24-ha peach orchard twice during each of three seasons were at least as effective as the conventional insecticide treatment in suppressing population buildup of the two species.
706. Yonce, C. E. 1981. Evaluation of the density of pheromone sources of (Z,Z 96:E,Z4) 3,13-octadecadien-1-ol acetate for disruption of the mating communication of Synanthedon exitiosa moths. Environ. Entomol. 10:164-166. The pheromone 3,13-octadecadien-1-ol acetate even at low density of sources, reduced captures of males and mating activity of the peachtree borer in a test of disruption of mating communication. Data from two methods of evaluation, male trapping and virgin female mating observations, were parallel and confirmed the effectiveness of disruption.
707. Yonce, C. E., and Gentry, C. R. 1970. Bait for oriental fruit moth attracts lesser peachtree borer moths. J. Econ. Entomol. 63:6. An emulsion of terpinyl acetate, Tween 20, water, and brown sugar was placed in jar lids and used as a survey trap within a poorly kept commercial orchard. Lesser peachtree borers were captured from August through October in abundant numbers while 13 peachtree borers, 4 dogwood borers, and 1 oriental fruit moth were also captured.
708. Yonce, C. E.; Gentry, C. R.; Nielsen, D. G.; and Purrington, F. F. 1979. Influence of trap design and placement on captures of lesser peachtree borer and peachtree borer males. U.S. Sci. Educ. Admin. Agric. Res. Results, Northeast. Ser. 6, pp. 55-66. This is a generalized article on trapping borers and contains little data not given in other papers.



709. Yonce, C. E.; Gentry, C. R.; and Pate, R. R. 1971. Artificial diets for rearing larvae of the plum curculio. J. Econ. Entomol. 64:1111-1112. When six artificial diets were tested for use in rearing the plum curculio, a yield of 45 percent was obtained in a CSM diet, and a 58 percent yield was obtained with a pinto diet. This compared to a yield of about 58 percent in the check. The other diets used were unsatisfactory.
710. Yonce, C. E.; Gentry, C. R.; and Pate, R. R. 1972. A complete artificial diet for rearing the plum curculio. J. Econ. Entomol. 66:362-363. Plum curculios were successfully reared through five generations on a modified pinto bean diet. The diet was shaped into cylindrical plugs for adult oviposition and feeding. Production of larvae and adults increased substantially with each succeeding generation.
711. Yonce, C. E.; Gentry, C. R.; Tumlinson, J. H.; Doolittle, R. E.; Mitchell, E. R.; and McLaughlin, J. R. 1976. Seasonal distribution of the lesser peachtree borer in central Georgia as monitored by pupal skin counts and pheromone trapping techniques. Environ. Entomol. 6:203-206. Seasonal population trends for the LPTB in central Georgia were determined from 1967-75 using pupal skin counts and sticky traps baited with synthetic pheromone. Both systems were effective in indexing population, but adequate data were obtained only in the peaks of activity. Two peaks usually occurred, the first in May and the second in August or September.
712. Yonce, C. E.; Gentry, C. R.; Tumlinson, J. H.; Doolittle, R. E.; and Nielsen, D. G. 1976. Lesser peachtree borer: influence of trap height, substrates, concentration and trap design on capture of male moths with females and a synthetic pheromone. Environ. Entomol. 5:417-420. Field-trapping studies are reported from 1973 to 1974 with either the (E,Z)-3,13-octadecadien-1-ol acetate synthetic pheromone or with virgin female moths. Traps baited with virgin females caught significantly more male borers when they were 2 m above the ground, but traps baited with the synthetic pheromone captured males equally well at ground level or at 3 m heights. Rubberbands and rubber septa were the best of the substrates tested for dispensing the pheromone. Each tenfold increase in concentration of synthetic pheromone increased the capture of males significantly.
713. Yonce, C. E., and Jacklin, S. W. 1974. Life history of the white peach scale in central Georgia. J. Ga. Entomol. Soc. 9:213-216. The white peach scale is cited as becoming a threat to peach trees in the Southeast. Mated, mature females overwinter and give rise to the first of four generations beginning in early spring. The average intervals between generations were 72 days for first to second, 53 days for second to third, and 48 days from third to fourth. Significant field control resulted from a hymenopteran parasite (probably Prospaltella berlesei) and a predaceous beetle larvae (probably Lindorus lophan-tae).
714. Yonce, C. E., and Jacklin, S. W. 1978. Reproductive behavior and laboratory rearing performance of Conotrachelus nenuphar (Herbst). J. Ga. Entomol. Soc. 13:290-295. Males were found to mate during their first day of life and mate up to three times in a day. Females did not mate until their fourth day of life. The time between mating and oviposition was greater for young females and became shorter as females reached sexual maturity. Females and males did not show any preference in time of day for mating. In a light-day cycle, most oviposition tended to occur during darkness with the highest levels during 2000 to 2400 h. High male ratios

significantly reduced female longevity, probably because of harassment.

715. Yonce, C. E., and Pate, R. R. 1979. Seasonal distribution of Synanthedon exitiosa in the Georgia peach belt monitored by pheromone trapping. Environ. Entomol. 8:32-33. During a 4-year study in central Georgia, male PTB flight was shown to begin the last week of October. The correct pheromone dosage was cited as 100 ug/trap. Pheromone traps were cited as adequate for detecting infestations and characterizing flight activity.
716. Yonce, C. E.; Payne, J. A.; and Pate, R. R. 1972. Feeding and oviposition preferences of female plum curculios. J. Econ. Entomol. 65:1206-1207. Plum curculio adults were noted to probe and deposit eggs in apples coated with paraffin, but deposition was reduced successively with increasing layers of paraffin. Also, females were found to prefer to oviposit in the curved surface of apples with peels.
717. Yonce, C. E.; Tumlinson, J. H.; Gentry, C. R.; and Mitchell, E. R. 1974. Extraction and field bioassay of the sex pheromone of the lesser peachtree borer. Environ. Entomol. 3:569-570. This paper reports the most attractive age of virgin females for males, presents details for the extraction of pheromone from adult females, and outlines a field bioassay procedure.

## Z

718. Zwet, T. van der, and Thompson, J. M. 1976. Sensitivity to fire blight in pear controlled by a dominant gene. (Abstr.) Annu. Proc. Am. Phytopathol. Soc. 2:50-51. Sensitivity of Pyrus communis cultivars to the fire-blight bacterium, Erwinia amylovora, is apparently governed by a dominant gene designated Se. Frequency of distributions of blight ratings in 108 progenies were studied, and the breeding behavior of each sensitive parent is reported.





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## X

Xyleborus spp. See pinhole borer

## Y

Yellow pecan aphid. See pecan aphids











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